EFFECTIVENESS OF FOOT REFLEXOLOGY ON BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION AT SELECTED HOSPITAL, COIMBATORE.

BY

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CERTIFICATE

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ABSTRACT

A Study was conducted to evaluate the Effectiveness of Foot Reflexology on Blood Pressure among Patients with Hypertension at Selected Hospital, Coimbatore.

The main aim of the study was to evaluate the effectiveness of foot reflexology on blood pressure among patients with Hypertension. Quasi experimental pre-test post-test control design was adopted. The study was conducted in the in-patient wards of Kongunad Hospital, Coimbatore. 60 samples (30 each in experimental and control group) were selected using non probability purposive sampling technique. The conceptual framework selected for the study was based on Wiedenbach's Helping Art of Clinical Nursing Theory (1970). The intervention given was foot reflexology, once daily with duration of 20 minutes for 5 consecutive days. Pre-test was done for both groups using semi- structured interview schedule and Blood pressure chart was maintained for 5 consecutive days. Post test was conducted in both experimental and control group, 30 minutes after pre-test. The data were analyzed using descriptive and inferential statistics. The findings stated that in the experimental group, with regard to systolic blood pressure, the mean of pre and post-test was 139.4 ± 5.89 and 134.73 ± 3.33 respectively and with regard to diastolic blood pressure, the mean of pre and post-test was 90.4 ± 1.2 and 81.33 ± 2.60 respectively. In the control group, with regard to systolic blood pressure, the mean of pre and post-test was 137.8 ± 4.94 and 138.47 ± 4.49 respectively and with regard to diastolic blood pressure, the mean of pre and post-test was 90.2 ± 0.6 and 91.07 ± 0.99 respectively. The calculated paired 't' value 5.89 for systolic blood pressure and 20.79 for diastolic blood pressure were greater than the table value 2.46 at $p \leq 0.01$. Hence, the hypothesis H_1 was retained. The calculated unpaired 't' value 3.6 for systolic blood pressure and 18.85 for diastolic blood pressure were greater than the table value 2.39 at $p \leq 0.01$. Hence, the hypothesis H_2 was retained. In the experimental group, with regard to systolic blood pressure, significant association was found between sex, marital status, education, occupation, income, family type, place of living, physical activity, exercise, duration of hypertension, regularity of medication, co-morbid illness and duration of medication and with regard to diastolic blood pressure, significant association was found between marital status, education, place of living, duration of hypertension, family history, co-morbid illness and duration of medication. In the control group, with regard to systolic blood pressure, significant association was found between family type, habit, exercise and co-morbid illness and with regard to diastolic blood pressure, significant association was found between age, income, family type, habit, exercise, duration of Hypertension, co-morbid illness and duration of medication. Hence, the hypothesis H_3 was retained for the above mentioned variables. The findings of the study revealed that foot reflexology reduced the high blood pressure among patients with Hypertension. Thus the inferential statistics displayed that foot reflexology significantly reduced the high blood pressure among experimental group. Foot reflexology is a way to enhance the nurse-patient interrelationship. It offers a strategy to fulfil the goals for human touch and holistic nursing care. It can be performed at any location, is non-invasive, and does not interfere with patients' privacy.

CHAPTER I

INTRODUCTION

"Your body is a temple, but only if you treat it as one."

- Astrid Alauda

Maintenance of good health is the means to living, existence, zest for life, feelings of being and happiness. Health not only means absence of sickness but presence of feelings and behaviours which constitutes different kinds of health. Achieving and maintaining health is an ongoing process, shaped by both the evolution of health care knowledge and practices as well as personal strategies and organized interventions for staying healthy known as lifestyle management.

The Times of India (2013) reported that, according to WHO health statistics 2012, the prevalence of hypertension in India was 23.1% in men and 22.6% in women in equal or more than 25 years age. The raised blood pressure was a high risk condition that caused approximately 51% of death from strokes and 45% from coronary artery disease. It was considered directly responsible for 7.5 million deaths in 2004, about 12.8 percent of the total of all global deaths. Dr Purshottam Lal (Padma Vibhushan), Interventional Cardiologist also added that about one billion people or 25 per cent of the world's adult population was hypertensive. About 7.5 million deaths every year and an untold number of cardiovascular events like strokes, heart attacks, heart failure , aneurysms and so on was also reported in the same article.

As per the **World Health Statistics 2012**, of the estimated 57 million global deaths in 2008, 36 million (63%) were due to non-communicable diseases (NCDs). The largest proportion of NCD deaths is caused by cardiovascular diseases (48%). In terms of attributed deaths, raised blood pressure is one of the leading behavioural and physiological risk factor to which 13% of global deaths are attributed. Hypertension is responsible for 57% of stroke deaths and 24% of CAD in India. Hypertension is reported to be the fourth contributor to premature death in developed countries and the seventh in developing countries.

High blood pressure, often called the silent killer, can go undetected and lead to very serious cardiovascular problems. In most cases, high blood pressure can be diagnosed and treated through common, natural solutions like weight loss and dietary restrictions like less salt intake & cholesterol diets or limiting alcoholic drinks. However, most high blood pressure is addressed through the patient medication prescription. Because of the seriousness of high blood pressure, it is always recommended to take and stick to the physician's advice.

Hypertension is a medical term used to describe increased pressure in the arterial system that transports blood from heart to rest of the body. Hypertension is defined as an average systolic blood pressure above 140 mm Hg, and a diastolic blood pressure above 90 mm Hg or both.

The **Seventh Report of the Joint National Committee** on Prevention, provides a classification of BP for adults 18 years and older. The classification is based on the average of two or more properly measured, seated, BP readings on each of two or more office visits.

Blood Pressure Classification	SBP mmHg	DBP mmHg
Normal	<120	and <80
Prehypertension	120-139	or 80-89
Stage 1 Hypertension	140-159	or 90-99
Stage 2 Hypertension	≥160	or ≥100

SBP: Systolic Blood Pressure; DBP: Diastolic Blood Pressure

The first recording of human blood pressure came in **1847**, when German Physiologist **Carl Ludwig** inserted catheter in patient's artery and hooked the catheter to an invention called Kymograph. Kymograph is a device that monitors blood pressure by measuring the muscular contractions and physiological processes in the human body.

The first line of treatment for hypertension includes dietary changes, physical exercise, and weight loss. All these measures showed significant reduction in blood pressure in people with hypertension. Dietary change such as a low sodium diet is beneficial. Also, the DASH diet, a diet rich in nuts, whole grains, fruits, fish, poultry and vegetables lowers blood pressure. Some programs aimed to reduce psychological stress such as biofeedback or transcendental meditation may be reasonable add-ons to other treatment to reduce hypertension. Several exercise regimes including isometric resistance exercise, relaxation therapy, aerobic exercise, resistance exercise and device-guided breathing are found to be useful in reducing blood pressure.

Massage is the oldest form of healing and has been practiced across the world from India to Rome. **Dr. Fitzgerald** was the pioneer of reflexology treatment who specialized in the ear, nose and throat area. Reflexology is a sensational, dynamic yet simple approach to glowing health.

Reflexology Association of Canada (2011) defines reflexology as "a natural healing art based on the principle that there are reflexes in the feet, hands and ears and their referral areas within zone related areas, which correspond to every part, gland and organ of the body. Through application of pressure on these reflexes without the use of tools, the feet being the primary area of application, reflexology relieves tension, improves circulation and helps promote the natural function of the related areas of the body"

Foot reflexology has been practiced for thousands of years in places such as India, China and Egypt. In ancient times, people stimulate reflexes naturally by walking barefoot over rocks, stones and rough ground. In today's modern world, nature's way of maintaining a balanced and healthy equilibrium is lost. Reflexology helps to restore this balance and promote natural health and vitality.

Hypertension is one of the conditions purported to be improved by complementary therapies such as foot reflexology. Pressure techniques applied on the feet are believed to help unblock nerve supply and improve blood flow, which may help the body to function at its peak. It is claimed that reflexology relieves stress and tension by inducing relaxation. It brings about vasodilatation, reduced blood pressure, improved blood flow and provision of oxygen-rich nutrients to cells.

Lu WA, Chen GY, Kuo CD (2011) conducted a study to investigate the effect of foot reflexology to lower blood pressure in healthy subjects and patients with coronary artery disease. 17 people with angiographically patent coronary arteries and 20 patients with CAD recruited as the control and CAD groups, respectively. The systolic, diastolic, mean arterial, and pulse pressures were

significantly decreased after foot reflexology in both groups. In the CAD group, the percentage change in heart rate 30 and 60 minutes after foot reflexology was smaller than that in the control, and the percentage change in nVLFP 60 minutes after foot reflexology was smaller than that in the control. It was concluded that foot reflexology may be used as an efficient adjunct to the therapeutic regimen to increase the vagal modulation and decrease blood pressure in both healthy people and CAD patients.

Dr. Jesus Manzanares, M.D (2010) at the University Hospital and Sagrado Corazon Hospital in Barcelona, Spain studied the effectiveness of reflexology treatment on Hypertension in 54 patients with high blood pressure. He split them into two groups. One group had a general reflexology treatment done on a regular basis, while the second group had a specific targeted reflexology session. The target sessions focused on the heart, predominant frontal cortex, sympathetic thoracic ganglions, and kidneys. When the testing was complete the doctor found that 50% (27 people) were able to achieve lower blood pressure levels, even while reducing their regular medication.

NEED FOR THE STUDY

The **World Health Statistics (2010)** highlighted the increasing problems related to the non-communicable diseases such as blood pressure and diabetes. Worldwide, one in three adults has raised blood pressure that causes half of all deaths from stroke and heart disease.

The prevalence of hypertension in the late nineties and early twentieth century varied among different studies in India, ranging from 2 to 15% in Urban India and 2 to 8% in Rural India. The prevalence of hypertension in the last six decades has increased from 2% to 25% among urban residents and from 2% to 15% among the rural residents in India. According to Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India, the overall prevalence of hypertension in India by 2020 will be 159.46/1000 population.

There are large regional differences in cardiovascular mortality in India among both men and women. The mortality is highest in South Indian states, Eastern and North-eastern states and Punjab in both men and women, while mortality is the lowest in the central Indian states of Rajasthan, Uttar Pradesh and Bihar.

The Hindu (2012) stated that a study published in the International Journal of Public Health, reported that the prevalence of hypertension was 21.4 per cent in about 10,500 people (aged 25-64) in 11 villages in the State. Prevalence was nearly the same in both sexes. Though earlier studies had documented 16 per cent prevalence in rural areas, studies carried out later in other States had reported 20 per cent prevalence. Prevalence of hypertension in urban areas was 22-30 per cent. Hypertension is one of the major risk factors for cardiovascular diseases, stroke and kidney failure. It was also found that, about 24.5 per cent of deaths in people aged 45-59 years in rural Tamil Nadu are caused by diseases of the circulatory system.

Park HS, et al., (2004) conducted a quasi-experimental study in Korea to evaluate the effects of foot reflexology on blood pressure in 34 essential hypertension patients. Among the subjects, 18 were assigned to experimental group and 16 to control group. Foot reflexology was administered twice a week for 6 weeks and self-foot reflexology was practiced by samples twice a week for 4 weeks in the experimental group. There was a significant decrease in systolic blood pressure but no significant decrease in diastolic pressure in the experimental group compared to the control group. The results proved that foot reflexology was an effective nursing intervention to decrease systolic blood pressure.

Kaye AD, et al., (2008) conducted a study to describe the effects of deep tissue massage on systolic, diastolic, and mean arterial blood pressure. A total of 263 volunteers, (12% male & 88% females) with an average age group of 48.5 were participated in the study for 45 & 60 minutes. Blood pressure and heart rate were measured with an automatic blood pressure cuff. Results shown that there was a significant reduction of systolic pressure by 10.4 mm Hg ($p<0.06$), diastolic pressure by 5.3mm Hg ($p<0.04$) and mean arterial pressure by 10.8 beats per minute ($p<0.003$).

In a world of ever increasing technology and machine controlled medical interventions, people are beginning to need for a human touch which is more natural approach to health care that seeks to enhance life rather than dissect illness into more and more obscure diseases. There are a number of therapies which have a positive and holistic approach in a natural way. Complementary therapy is proved to be one of the effective treatments for most of the disease conditions. Complementary therapy such as yoga, acupuncture and homeopathy improve circulation, help boost immune system, eliminate toxins, reduce stress and tension, relieve pain, induce deep relaxation and restore balance to body systems.

Foot reflexology is a non-invasive, cost effective method used for the reduction of blood pressure. It is a readily available, painless procedure that can be applied to any person without consideration of time and place. This form of treatment demands no special devices or requirements.

After the personal experience in the clinical area and after reviewing the related literature, the investigator planned to conduct a study to evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension. Investigator was interested in the implication of foot reflexology among hypertensive patients to decrease the elevated blood pressure. Such intervention will help to reduce the high blood pressure in the selected patients.

Statement of the Problem

A Study to evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension at selected hospital, Coimbatore.

Objectives of the Study

- To assess the blood pressure of patients with hypertension in experimental and control group.
- To evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension in experimental group.
- To associate the pre and post-test blood pressure scores of patients with hypertension with their selected demographic variables.

Operational Definition

Effectiveness:

It refers to the reduction of high blood pressure after implementation of foot reflexology among patients with hypertension, as measured by using a calibrated sphygmomanometer, as determined by the difference in pre and post test scores and which is statistically significant.

Foot reflexology:

It refers to the therapeutic application of five steps of massage to both feet of patients with hypertension for a period of 10 minutes on each foot, once daily for 5 consecutive days as a relaxation therapy.

Patients with Hypertension:

In this study, it refers to the in-patients, diagnosed to have hypertension for a period of less than 10 years.

Hypotheses

H_1: There is a significant difference in the pre and post-test level of blood pressure among samples in experimental group.

H_2: There is a significant difference between the post-test level of blood pressure among samples of experimental and control group.

H_3: There is a significant association between the level of blood pressure among samples and their selected demographic variables in both experimental and control group.

Assumption

Therapeutic application of foot reflexology may decrease elevated blood pressure in patients with hypertension.

Delimitations

- The study is limited to a sample size of 60.
- Data collection procedure is limited to 4 weeks.

Projected Outcome

The present study was conducted with an aim to reduce high blood pressure using foot reflexology and associate the same with selected demographic variables among hypertensive patients. Foot reflexology will reduce the high blood pressure among hypertensive patients. The finding would help nurses to incorporate foot reflexology in provision of routine nursing care.

Conceptual Framework

The conceptual framework is the processor of theory. It provides a broad perspective for nursing practice, research and education. Conceptual framework plays several interrelated roles in the progress of science. Their overall purpose is to make scientific findings meaningful and generalizable.

Polit and Hungler (1995) state that, conceptual framework is interrelated concept or abstractions that are assembled together in some rational scheme by virtue of their relevance to a common theme. It is a device that helps to stimulate research and extension of knowledge by providing both direction and impetus.

The conceptual framework for the present study was adopted from Wiedenbach's Helping Art of Clinical Nursing Theory (1970). This theory directs action towards the explicit goal.

It consists of three factors:

- ❖ Central purpose
- ❖ Prescription
- ❖ Realities

Central Purpose

Central purpose refers to what the nurse wants to accomplish. It is the overall goal towards which the nurse strives. It transcends the immediate intent of the task by specifically directing activities towards the objectives. In this study, central purpose refers to reduction of high blood pressure in patients with hypertension.

Prescription

Prescription refers to the plan of action for individual. It specifies the nature of the action that will fulfill the nurse's central purpose and the rationale for that action. In this study, prescription refers to assessing the demographic variables of patients with hypertension and their blood pressure before administration of foot reflexology.

Realities

Realities refer to the physical, physiological, emotional and spiritual factors that come into play in a situation involving actions. The five realities identified by Wiedenbach's are agent, recipient, goal, means and framework.

Agent

Agent is the researcher or designee who has the personal attributes, capacities, capabilities, commitment and competence to provide action.

Recipient

Recipient is one who receives an intervention or action.

Goal

Goal refers to researcher's desired outcome.

Mean

The activities and devices used by the researcher to achieve the goal.

Framework

It refers to the facilities in which area nursing is practiced.

The conceptualization of the nursing practice for the present study has 3 steps.

Step I: Identifying a need for help

Identifying need for help determines patient's need for help based on the existence of a need. In this study a need for help was identified by assessing the demographic variables of patients with hypertension and their blood pressure before administration of foot reflexology.

Step II: Ministering a needed help

Ministration refers to provision of needed help. It requires an identified need and a patient who wants help. After identifying the need for help, intervention has to be implemented.

In this study, ministering a needed help was provided as follows,

Agent **:** Investigator

Recipient **:** Patients with Hypertension who are admitted in Kongunad Hospital.

Goal **:** To reduce the high blood pressure

Mean **:** Foot Reflexology

Framework **:** Kongunad Hospital, Coimbatore.

Step III: Validating that a need for help was met

Validation refers to collection of evidence that shows a patient's need have been met and that his functional ability has been restored as a direct result of the nurse's actions. In this study, evaluation is established by determining the difference in pre and post-test assessment of blood pressure among patients with Hypertension.

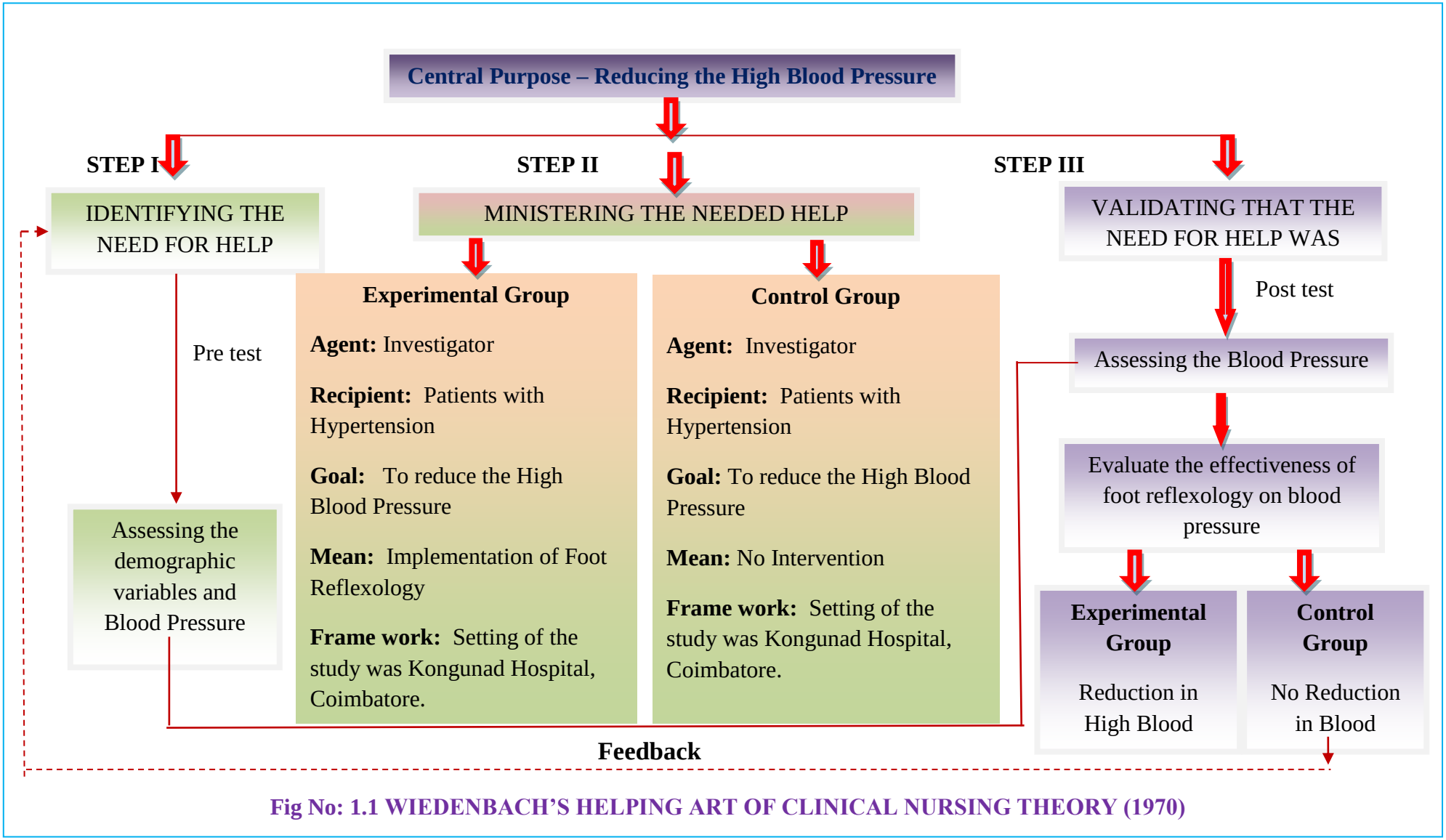

Fig No: 1.1 WIEDENBACH'S HELPING ART OF CLINICAL NURSING THEORY (1970)

SUMMARY

This chapter dealt with introduction, need for the study and statement of the problem, objectives, operational definition, assumption, hypothesis, delimitations, projected outcome and conceptual frame work.

CHAPTER II
REVIEW OF LITERATURE

According to **Polit and Hungler (2003)** literature review is a written summary of the state of existing knowledge on a research problem. The task of reviewing research literature involves the identification, selection of a critical analysis and written description of existing information on a topic.

The review of literature was organized under the following headings:

- Literature related to Hypertension
- Literature related to Foot reflexology
- Literature related to Foot reflexology and Hypertension

I. Literature Related to Hypertension:

Sujatha.T, Judie.A (2014) conducted a study to find the effectiveness of Yoga program (YP) on physio-psychological parameters among 238 hypertensive patients in community health centre, Kancheepuram. Blood pressure (BP), heart rate (HR), body mass index (BMI), anxiety and perceived stress were measured. State Trait Anxiety Inventory (STAI) and Perceived Stress Scale (PSS) were used. The participants were asked to practice yoga for 30– 45 minutes at home, after an intensive training for 12 weeks. Before intervention, 46% and 48% had higher level of stress in YP and control group respectively. After intervention, the YP group exhibited reduced BP, HR, BMI, anxiety, and perceived stress at $p< 0.001$ than the control group.

Kumutha et al., (2014) conducted an experimental study to evaluate the effectiveness of Progressive Muscle Relaxation (PMR) technique on stress and blood pressure among 30 elderly with hypertension in rural health and training centre of SRMC & RI at Vayalanallur and Anaikattucherry. Stress level was assessed by Perceived Stress Scale (PSS). The study group (n=30) demonstrated PMR once a day for 20 minutes for 21 days. The survey (pre-test), demonstration of PMR and practice of PMR for 21 days was carried among the samples. The result highlighted PMR to be an effective method to decrease the stress and blood pressure among experimental group at $p<0.001$.

Rosakutty George et al., (2012) conducted a pre-experimental study to find the effectiveness of a structured teaching programme on the knowledge level among forty hypertensive adults using non probability purposive sampling technique. Demographic proforma, knowledge checklist and 5 point rating scale on perceived barriers of lifestyle modification were used. The study revealed that the mean post-test knowledge scores of subjects were significantly higher than their mean pre-test knowledge scores. [t calculated value = 22.22 is greater than the t table value (39) = 1.68, $p<0.05$].

Hayden et al., (2007) conducted an experimental study among 600 hypertension patients. Samples were randomized to 1 of 4 arms: (1) control group—a group of hypertensive patients who received usual care; (2) nurse-administered tailored behavioural intervention; (3) nurse-administered medication management according to a hypertension decision support system; (4) combination of behavioural and medication management. The primary outcome was reduction of BP to ≤140/90 mm Hg (non-diabetic) and ≤130/80 mm Hg

(diabetics) patients. It was concluded that testing novel interventions in patients' homes might improve access, quality and outcomes.

L.Kannan, T.S.Satyamoorthy, (2002) conducted a cross sectional study to measure the prevalence of hypertension and identify the risk factors in a rural population in Mugalivakkam among 750 individuals using cluster-sampling method. Blood pressure was measured and recorded. Out of 750 adults, 189 individuals were found to be suffering from hypertension including 93 known hypertensives. The overall prevalence rate of hypertension in both sexes was 25.2%. The prevalence rate was higher (27.4%) among females than males (22.6%). Increase in age, family size, occupation, alcohol, smoking, chewing tobacco, obesity, oral contraceptives use and diabetes mellitus were found to have association with hypertension.

II. Literature Related to Foot Reflexology

Preethy Mary et al., (2014) conducted a quasi-experimental study to assess effect of foot reflexology on psychological wellbeing of 30 elderly in selected old age home of Indore using random sampling technique. Modified Psychological General Wellbeing Index (Modified PGWBI) was used to assess the level of psychological wellbeing. After 15 days of intervention of foot reflexology findings showed that the mean score level of psychological wellbeing was 58.3 at pre-test which was increased to 60.27 at post-test which was statistically significant at $p < 0.001$. The result confirmed that foot reflexology was effective in enhancing the level of psychological wellbeing for elderly.

Jipi Vargheseet. al., (2014) conducted a randomized control trial to determine the effect of foot reflexology on intensity of pain and quality of sleep in 60 post caesarean mothers in Dakshina Kannada. The tools used were Pittsburgh Sleep Quality Index (PSQI) and Visual Analogue Scale (VAS). Experimental group received a single 15-minute foot reflexology session at the same time each evening for five consecutive days. After 5 days of treatment, results showed that the mean PSQI were found to be significantly lower in the intervention group ($p<0.001$) than in the control group. The post-test mean score of pain in experimental group was significantly lower than of control group ($X = 4.75$, $X = 7.65$, $t = -10.627$, $p<.001$). Also, there was a significant difference between groups in terms of the pain intensity and requesting for analgesic ($p < .001$).

Saeed Babajani et al., (2014) conducted a randomized clinical study to determine the effect of foot reflexology on the level of pain during chest tube removal after open heart surgery in Baqiyatallah Medical Sciences University among ninety samples. Pain level was measured through Numerical Rating Scale (NRS). In the experimental group, centre of the anterior one-third of the left foot and in the placebo-treated group, posterior one-third of the left foot was being massaged for ten minutes before chest tube removal. Pain was not increased due to the chest tube removal in the experimental group ($p=0.08$), while placebo-treated and control groups had significant increase of the pain ($p=0.001$ and $p=0.000$ respectively). It was concluded that foot reflexology was a useful nursing intervention in reducing pain in subjects during chest tube removal after open heart surgery.

Gholamhosyn Mahmoudirad et al., (2013) conducted a quasi-

experimental study to evaluate the effect of foot reflexology among 70 patients undergoing coronary artery angiography in Iran using convenience sampling method. Tools used were a semi-structured questionnaire and Spielberg's anxiety questionnaire. Samples in experimental group received foot reflexology for 20 minutes. The results showed that there was significant difference in the mean anxiety score in intervention group before, immediately after and half an hour after intervention when compared with control group at $p<0.001$.

Wyatt GA (2012) conducted a longitudinal study on health-related Quality-of-Life with Reflexology for 385 patients with advanced stage Breast Cancer using convenient sampling method. Women were randomized into three primary groups: reflexology (n = 95), lay foot manipulation (LFM) (n = 95), or conventional care (n = 96). Two preliminary reflexology (n = 51) and LFM (n = 48) test groups were used to establish the protocols. A longitudinal comparison revealed that significant improvements in physical functioning was observed for the reflexology group when compared to the control group ($p = 0.04$). Severity of dyspnea was reduced in the reflexology group when compared to the control group ($p < 0.01$) and the LFM group ($p=0.02$). No differences were found on breast cancer-specific HRQOL, depressive symptomatology, state anxiety, pain, and nausea.

Lee YM (2006) conducted an experimental study to identify the effects of a self-foot reflexology massage on depression, stress responses and functions of the immune system of 46 middle-aged women from Community Health Centre in Busan city, Korea. Subjects were trained in self-foot reflexology massage for 2 weeks, and then practiced for 6 weeks by self (2 days at the research centre, 5

days at home).The outcome variables were measured 4 times, (i.e) at baseline, pre training, after training, and after the intervention. The results showed that there was a statistically significant difference in perceived stress, depression, systolic blood pressure, natural-killer cells and IgG. However, there was no significant difference in diastolic blood pressure, pulse or serum cortisol.

Jin SJ, Kim YK (2005) conducted a quasi-experimental study to investigate the effects of foot reflexology massage on sleep and fatigue of 100 elderly women in University of Pusan. The foot reflexology massage was performed for 45 minutes every three days for experimental group. The results showed that the sleep and fatigue scores of the experimental group were significantly higher and lower than that of the control group respectively. It was observed that the sleep score was increased and that of fatigue was relieved gradually as the frequency of the foot reflexology massage increased for the experimental group.

Mahboubeh Valiani et al., (2005) conducted a quasi-experimental study to compare the effects of reflexology methods and ibuprofen administration on dysmenorrhea among 80 students using simple random sampling method in Isfahan University of Medical Sciences. Visual Analog Scale (VAS) and Pain Rating Index (PRI) scale was used. In the reflexology group, ten days before the probable menstruation time, reflexology was done for 20 minutes on each foot during two consecutive days for two consecutive menses cycles The Ibuprofen group received Ibuprofen (400 mg) once every eight hours for 3 days during 3 consecutive menses cycles. Independent and Paired t-test showed that there was a significant difference in the two groups between intensity and duration of menstrual pain using VAS and PRI in each of the 3 cycles between reflexology and Ibuprofen groups ($p < 0.05$).

Kang HS, et al., (2004) conducted a quasi-experimental study to identify the effects of self-foot reflexology on urinary incontinence symptoms, vaginal contraction and daily life discomfort among 39 middle-aged women with urinary incontinence. In the experimental group, self-foot reflexology was applied for 30 minutes, three times a week for 4 weeks. The findings indicated that self-foot reflexology was an effective method for reducing urinary incontinence symptoms and daily life discomfort and for increasing pressure of vaginal contraction of middle-aged women.

Stephenson NL et al., (2000) conducted a quasi-experimental study to test the effects of foot reflexology on anxiety and pain among patients with breast and lung cancer in the South-eastern United States. Foot reflexology was performed to both feet for 30 minutes and a control condition for each patient (with at least a two-day break). It was found that following the foot reflexology intervention, samples experienced a significant decrease in anxiety and pain.

III. Literature related to Foot Reflexology and Hypertension

Ali Mohammadpour, Atefeh Dehnoalian, Javad Mojtabavi (2013) conducted a quasi-experimental study to determine the effect of foot reflexology, on systolic and diastolic blood pressures among 68 stroke patients using random sampling method. Experiment group received foot reflexology for 30 minutes. The results showed that the blood pressure was significantly reduced among the experiment group after receiving the foot reflexology ($P<0.05$). Hence it was concluded that there was positive effects of foot reflexology on reducing blood pressure in patients with stroke and could be used as a supplement treatment.

Elisabeth Ruiz Padial et al., (2012) conducted a study to evaluate the cardiovascular effects of reflexology among forty-one participants using random sampling technique. Samples were grouped as: reflexology (n=15), non-professional foot massage (n=14), and a waiting time control group (n=12). The study was performed during three 40-min sessions separated by weekly intervals. The results of the study showed that the three manipulations produce similar increase in inter-beat interval, heart rate variability and baroreceptor reflex sensitivity.

Lee, Hyeon-Soon, Kim, Dong-Oak (2012) conducted a quasi-experimental study to examine the effects of Aroma foot reflexology and foot reflexology on blood pressure, pulse rate and blood lipid level among 71 elderly essential hypertensive patients, Korea. The experimental group I (24 persons) underwent aroma foot reflexology, experimental group II (27 persons) underwent foot reflexology and control group (20 persons) followed conventional treatment to measure the effects. The systolic blood pressure ($p<.05$), the diastolic blood pressure ($p<.05$), and the pulse rate ($p<.01$) of experimental group I and II after intervening respectively with aroma foot reflexology and foot reflexology for 6 weeks significantly decreased, than the control group, but the blood lipid level showed no significant difference among 3 groups ($p>.05$). It was concluded that both aroma foot reflexology and foot reflexology had positive effects to decrease the blood pressure and pulse rates among hypertensive patients.

Karima Elshamy, Eman Elsafety (2011) conducted a quasi-experimental

study to investigate the effect of foot reflexology on blood pressure and quality of life among 80 hypertensive patients using random sampling technique. There was a statistically significant reduction of both systolic and diastolic blood pressure in the experimental group at $p>0.05$. There was no evidence for improvement in Quality of Life in either group.

Pranee Jongsomjit (2005) conducted a quasi-experimental study to determine the effects of foot reflexology on physiological response, relaxation and satisfaction among 30 hypertensive patients using purposive sampling technique. True foot reflexology and mimicked foot reflexology were administered. The results showed that after receiving true foot reflexology, samples had a significant reduction in high blood pressure, pulse rate, respiratory rate and enhanced relaxation and satisfaction at $p = 0.001$.

Cho et al., (2004) conducted an experimental study to evaluate the effects of foot reflexology on blood pressure, serum lipids, fatigue and self-efficacy among thirty-four hypertensive patients. Foot reflexology was administered twice a week for 6 weeks to the participants in experimental group. There was a significant decrease in systolic and diastolic blood pressure and fatigue in the experimental group when compared to the control group. After the foot reflexology, triglyceride, total cholesterol, high density lipoprotein, low density lipoprotein levels and self-efficacy for the experimental group was not decreased significantly when compared to the control group.

Summary

This chapter dealt with literature related to Hypertension, Foot reflexology and Foot reflexology and Hypertension.

CHAPTER III
RESEARCH METHODOLOGY

According to **Polit and Beck, (2004),** methodology of research refers to investigation of way of obtaining, organizing and analyzing data. Methodological studies address the development, validation and evaluation of research tool and methods.

This chapter deals with description of the different steps undertaken by the investigator in the study. It includes the research design, setting, variables, population, sample size, sample technique, sample criteria, description of the tool, content validity, pilot study, ethical consideration, data collection procedure and plan for data analysis.

Research Approach

Research approach is an important element of the research design, which governs it. It involves the description of the plan to investigate the phenomenon under study in a structured method. The approach used in this study was quantitative evaluative approach.

Research Design

Denise.E.Polit, (2008) defines research design as the overall plan for addressing a research question including specification for enhancing the study's

integrity.

Quasi Experimental pre-test post-test control group design was selected to evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension.

E	**O_1**	**X**	**O_2**
C	**O_1**	**-**	**O_2**

E= Experimental group

C= Control group

X= Foot reflexology

O_1 = Pre test

O_2 = Post test

Population

Polit and Hungler, (1999) defined population as the entire aggregation of cases that meet a designed set of criteria.

The population of the present study were patients with hypertension who are admitted in hospitals.

Setting of the Study

Polit and Hungler, (1999) states that setting is the physical location and condition in which data collection takes place. Setting of the study is the essential constituent to ensure effective planning to conduct a research study. This study was conducted in the in-patient department of Kongunad Hospital, Coimbatore. Kongunad Hospital is a 250-bedded multi-speciality hospital with 24 hours emergency service and diagnostic facilities. It is situated in the heart of the Coimbatore city. The hospital comprises of 7 floors with all facilities, out-patient department and in-patient department, cardiac units, intensive care unit and

operation theatre facilities. The hospital receives an average of 200-210 patients every day. The average number of hypertension patients in the ward is about 15-20 patients per day. It provides tertiary health care services to public, who come from various parts of Tamilnadu.

Sampling

Sample:

Polit and Hungler, (1999) defined sample as the subset of population selected to participate in a research study.

The sample of the present study was patients with hypertension admitted in the in-patient ward in Kongunad Hospital, Coimbatore.

Sample Size:

The sample comprised of 60 patients with hypertension, comprising of 30 samples in experimental group and 30 in control group.

Sampling Technique:

Polit and Hungler, 1999 defined sampling technique is the process of selecting a portion of the population to represent the entire population.

Non-probability purposive sampling was selected for the present study.

Sampling Criteria:

The study samples were selected using the following criteria.

Inclusion criteria:

Patients with Hypertension:

- Below the age group of 70 years
- With the diagnosis for a period of less than 10 years

- Who were admitted in the in-patient ward
- Who were willing to participate in the study
- Who are on oral antihypertensive drugs
- Who can understand English or Tamil

Exclusion criteria:

Patients with Hypertension:

- Who are following any other relaxation techniques
- Who are psychologically instable
- Who are having foot ulcers
- Who have neuropathies

Variables

Variables are qualities, properties or characteristics of person, things, or situations that change or vary. Variables are classified based on their nature, actions, and effects on the variables.

Independent variable: Foot reflexology.

Dependent variable: Blood pressure.

Attribute variables

Attribute variables are the characteristics of the subjects that are collected to describe the sample, which includes age, gender, education, marital status, employment status and family income.

Development of the tool

The investigator prepared and developed a structured interview schedule as a tool for the present study after exploring the various sources of information. The proforma to assess the demographic data and the clinical details of

hypertension were developed by the investigator. Blood pressure chart was used to record the blood pressure of the subjects.

Description of the tool

The tool consists of three sections:

Section A : Demographic variables of the samples.

Section B : Clinical details of the Patients with hypertension.

Section C: Blood pressure chart measuring blood pressure before and after foot reflexology.

Section A

It consists of demographic variables such as Age, Sex, Marital status, Education, Occupation, Income, Type of family, Living locality, Diet pattern, Habit, Physical activity and Practice of regular exercise.

Section B

It consists of clinical details of Patients with hypertension, such as duration of illness, Family history, Regularity of Medication, Co-morbid illness and Duration of medication.

Section C

It consists of observation chart for blood pressure for the samples of both experimental and control group.

Table 3.1

BLOOD PRESSURE CHART

OBSERVATION	DAY 1		DAY 2		DAY 3		DAY 4		DAY 5	
DATE										
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Systolic blood pressure (in mm Hg)										
Diastolic blood pressure (in mm Hg)										

Content Validity

Polit and Hungler, 1999 defined content validity as the degree of which the item in an instrument adequately represents the universe of the content.

The tool developed by the investigator was sent along with the request for validation to a medical expert and five experts in the field of Medical Surgical Nursing. The experts were requested to check for the relevance, sequence and adequacy of language of the tool. The expert's suggestions were incorporated in the tool. Then the tool was finalized and used for the main study.

Reliability of the instrument

According to **Polit and Hungler, 1999** reliability refers to the degree of consistency or dependability with which an instrument measures the attribute it is designed to measure. Reliability of the tool was established by inter rater method and the obtained 'r' value is 0.88. Hence the tool was found reliable and considered for proceeding.

Pilot study

According to **Polit and Hungler, (1999)** pilot study refers to a small scale version or trial run done in preparation for a major study. Pilot study tests the reliability, practicability, appropriateness and feasibility of the study and the tool.

Pilot study was done among twelve hypertensive patients in the month of July 2014 after obtaining permission from the concerned authority. The setting was in-patient wards of Kongunad Hospital, Coimbatore. Data was obtained from all the samples and pre-test was conducted. Foot Reflexology was done for 10 minutes on both feet, once daily for 5 consecutive days for all the samples in the experimental group. Post test was conducted 30 min after pre-test in all the samples. Pilot study confirmed the adequacy of the tool and technique. Hence there were no modifications required in the main study.

Ethical consideration

Due permission was sought from the hospital authority including ethical committee clearance report. Informed verbal consent was obtained from all the samples. Assurance was given for the confidentiality of the information given by the samples. Routine care was not altered or withheld. Samples were allowed to withdraw from the study at any time.

Data collection procedure

Data was collected during the month of August from 01.08.2014 to 31.08.2014. The hypertensive patients who fulfilled the inclusion criteria were selected by purposive sampling technique. The purpose of the study was explained to the samples after self introduction of the researcher. Informed verbal consent

was obtained from the samples. The demographic data was collected through structured interview schedule in Tamil. Blood Pressure was measured and recorded in the observation chart for 5 consecutive days. Routine care was provided to all the samples included in this study. Foot reflexology was implemented. Post-test blood pressure was taken for all the samples after 30 min duration of the pre-test. Ethical aspects were considered throughout the study.

Plan for data analysis

The data were edited, coded and entered in the master sheet. The data were analyzed using descriptive and inferential statistics.

The data were analyzed as follows:

- To assess the blood pressure of patients with hypertension before foot reflexology, mean, standard deviation and mean percentage were used.
- To assess the effectiveness of foot reflexology on blood pressure among patients with hypertension after foot reflexology paired ‘t’test was used.
- To find the association between the blood pressure scores among samples with their selected demographic variables Chi-square was used.

Summary

This chapter deals with description of the different steps undertaken by the investigator in the study. It includes the research design, setting, variables, population, sample size, sample technique, sample criteria, description of the tool, content validity, pilot study, ethical consideration, data collection procedure and Plan for data analysis.

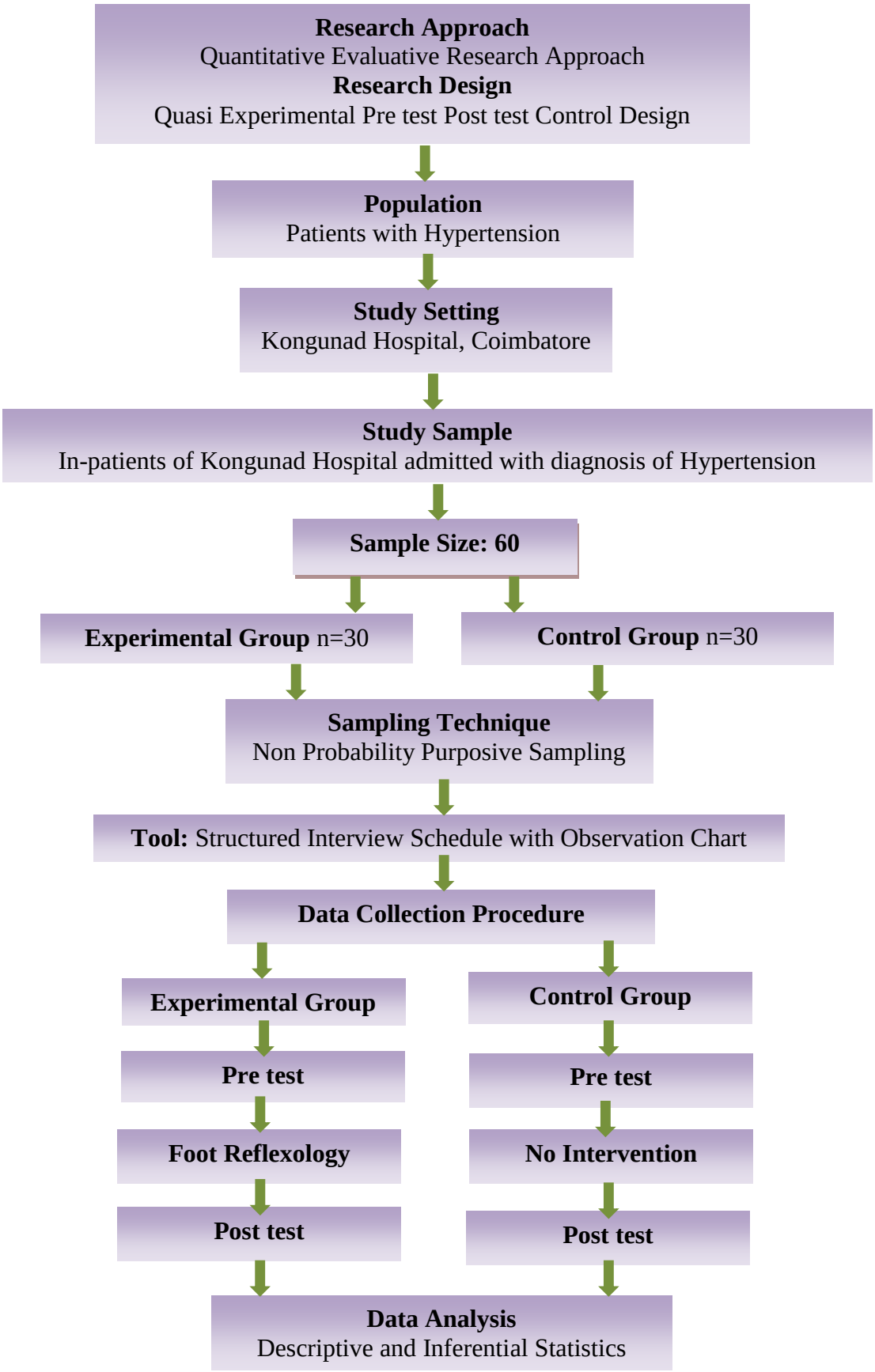

Figure 3.1 Schematic Representation of Research Methodology

CHAPTER IV
DATA ANALYSIS & INTERPRETATION

According to **Polit and Hungler (2006),** analysis is a method of rendering data in quantitative, meaningful and intelligible manner, so that research problem can be studied and tested and the relationship between the variables can be found.

This chapter deals with analysis and interpretation of data collected from 60 patients with hypertension at Kongunad Hospital, Coimbatore in order to evaluate the effectiveness of foot reflexology on blood pressure.

The data collected were analysed using descriptive and inferential statistics which are necessary to provide substantive summary by the results in relation to the objectives.

Objectives

- To assess the blood pressure of patients with hypertension in experimental and control group.
- To evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension in experimental group.
- To associate the pre and post-test blood pressure scores with their selected demographic variables in both experimental group and control group.

Presentation of Data

The findings of the study were grouped, analysed, organized and presented under the following sections:

Section A:

Distribution of patients with hypertension according to their demographic variables in experimental and control group.

Section B:

Comparison of pre-test and post-test score of blood pressure among experimental and control group.

Section C: Testing hypotheses

a. Comparison of pre-test and post-test Blood Pressure scores among experimental group

b. Comparison of post-test Blood Pressure score among experimental and control group

c. Association between the pre and post-test blood pressure score of samples and their selected demographic variables

Section A

Distribution of samples according to their Demographic variables in experimental and control group

Table 4.1

S. No	Demographic Variables	Experimental Group		Control Group	
		Frequency n=30	Percentage (%)	Frequency n=30	Percentage (%)
1.	Age				
	a) 31-40 years	0	0	0	0
	b) 41-50 years	7	23.33%	11	36.67%
	c) 51-60 years	14	46.67%	6	20%
	d) 61-70 years	9	30%	13	43.33%
2.	Sex				
	a) Male	13	43.33%	16	53.33%
	b) Female	17	56.67%	14	46.67%
3.	Marital Status				
	a) Unmarried	0	0	0	0
	b) Married	27	90%	28	93.33%
	c) Widow/Widower	3	10%	2	6.67%
	d) Divorcee	0	0	0	0
4.	Educational Status				
	a) Illiterate	4	13.33%	9	30%
	b) Primary Education	2	6.67%	5	16.67%
	c) Secondary Education	13	43.33%	5	16.67%
	d) Higher Secondary Education	10	33.33%	10	33.33%
	e) Graduate	1	3.33%	1	3.33%
5.	Occupation				
	a) Self Employed	9	30%	4	13.33%
	b) Government Job	4	13.33%	3	10%
	c) Private Job	1	3.33%	5	16.67%
	d) Retired	4	13.33%	5	16.67%
	e) Unemployed	12	40%	3	43.33%
6.	Monthly income				
	a) < Rs.5000	0	0	0	0
	b) Rs. 5001-7500	12	40%	16	53.33%
	c) Rs. 7501-10,000	15	50%	13	43.33%
	d) >Rs. 10,000	3	10%	1	3.33%
7.	Family type				
	a) Nuclear	25	83.33%	20	66.67%
	b) Joint	5	16.67%	10	33.33%

S. No	Demographic Variables	Experimental Group		Control Group	
		Frequency n=30	Percentage (%)	Frequency n=30	Percentage (%)
8.	Place of Living				
	a) Rural	14	46.67%	14	46.67%
	b) Urban	16	53.33%	16	53.33%
9.	Diet Pattern				
	a) Vegetarian	0	0	0	0
	b) Non-vegetarian	30	100%	30	100%
10.	Habit				
	a) Smoking	10	33.33%	11	36.67%
	b) Alcoholism	6	20%	9	30%
	c) Tobacco use	1	3.33%	4	13.33%
	d) Others	0	0	0	0
11.	Physical Activity				
	a) Sedentary	5	16.67%	4	13.33%
	b) Moderate	17	56.67%	20	66.67%
	c) Heavy	8	26.66%	6	20%
12.	Exercise				
	a) Yes	2	6.67%	3	10%
	b) No	28	93.33%	27	90%
13.	Duration of Hypertension	20	66.67%	17	56.67%
	a) < 5 years	10	33.33%	13	43.33%
	b) 5-10 years				
14.	Family History				
	a) Yes	7	23.33%	6	20%
	b) No	23	76.67%	24	80%
15.	Regularity of Medication	29	96.67%	30	100%
	a) Yes	1	3.33%	0	0
	b) No				
16.	Co-morbid Illness				
	a) Lung Disease	4	13.33%	5	16.67%
	b) Heart Disease	9	30%	8	26.67%
	c) Diabetes	18	60%	13	43.33%
	d) Others	8	26.67%	8	26.67%
17.	Duration of Medication	20	66.67%	17	56.67%
	a) < 5 years	10	33.33%	13	43.33%
	b) 5-10 years				

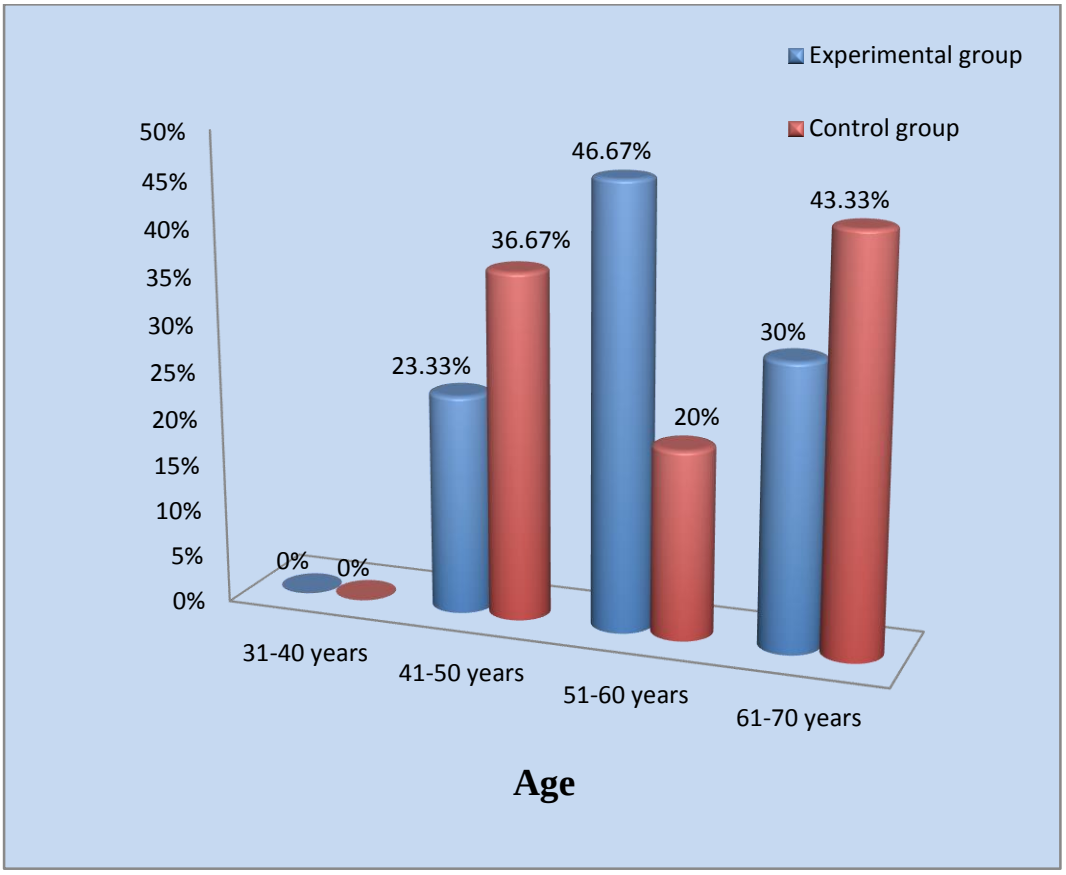

Fig.4.1.1 Percentage distribution of samples according to their age in experimental and control group

The above figure 4.1.1 shows that in experimental group, 14 (46.67%) samples belong to 51 to 60 years, 9 (30%) samples belong to 61 to 70 years and 7 (23.33%) samples belong to 41 and 50 years. But none of them were in 31 to 40 years.

In control group, 13 (43.33%) samples belong to 61 to 70 years, 11 (36.67%) samples belong to 41 to 50 years and 6 (20%) samples belong to 51 to 60 years. But none of them were in 31 to 40 years.

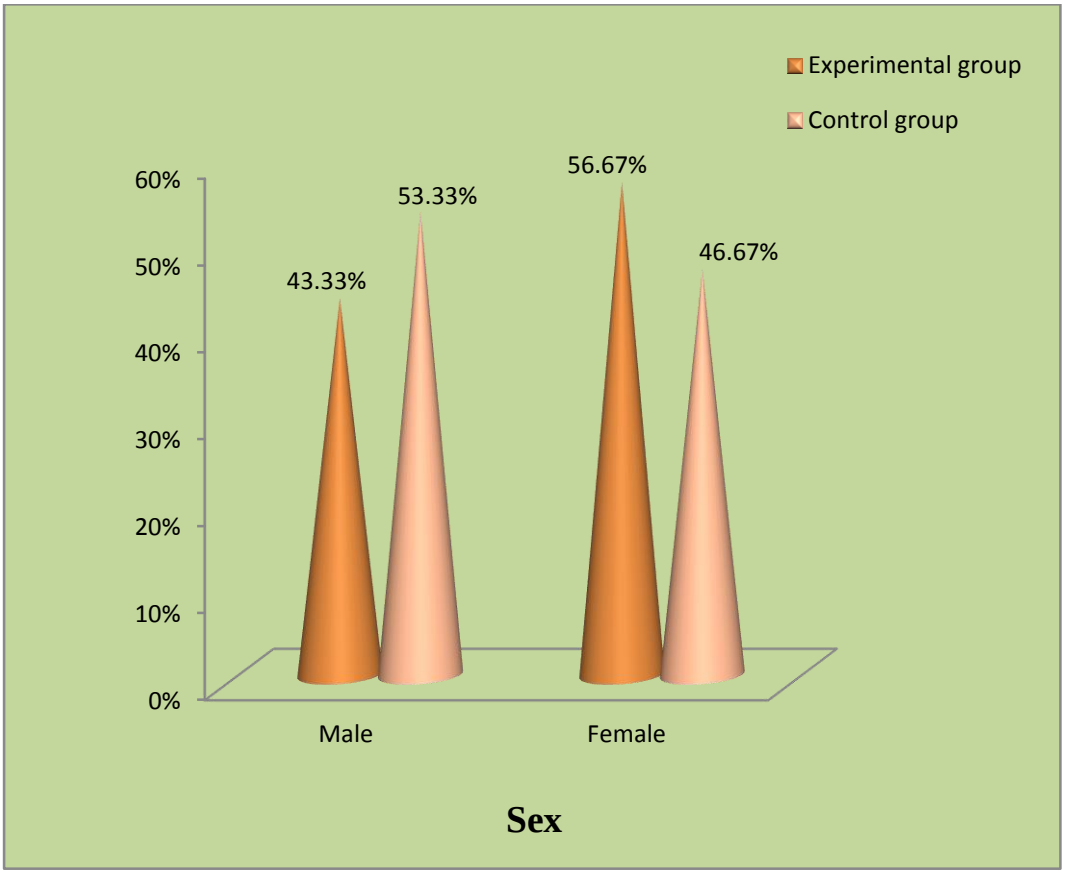

Fig.4.1.2 Percentage distribution of the samples according to their sex in experimental and control group

The above figure 4.1.2 depicts that in experimental group, 17 (56.67%) of the samples were female and 13 (43.33%) of the samples were male.

In control group, 16 (53.33%) of the samples were male and 14 (46.67%) of the samples were female.

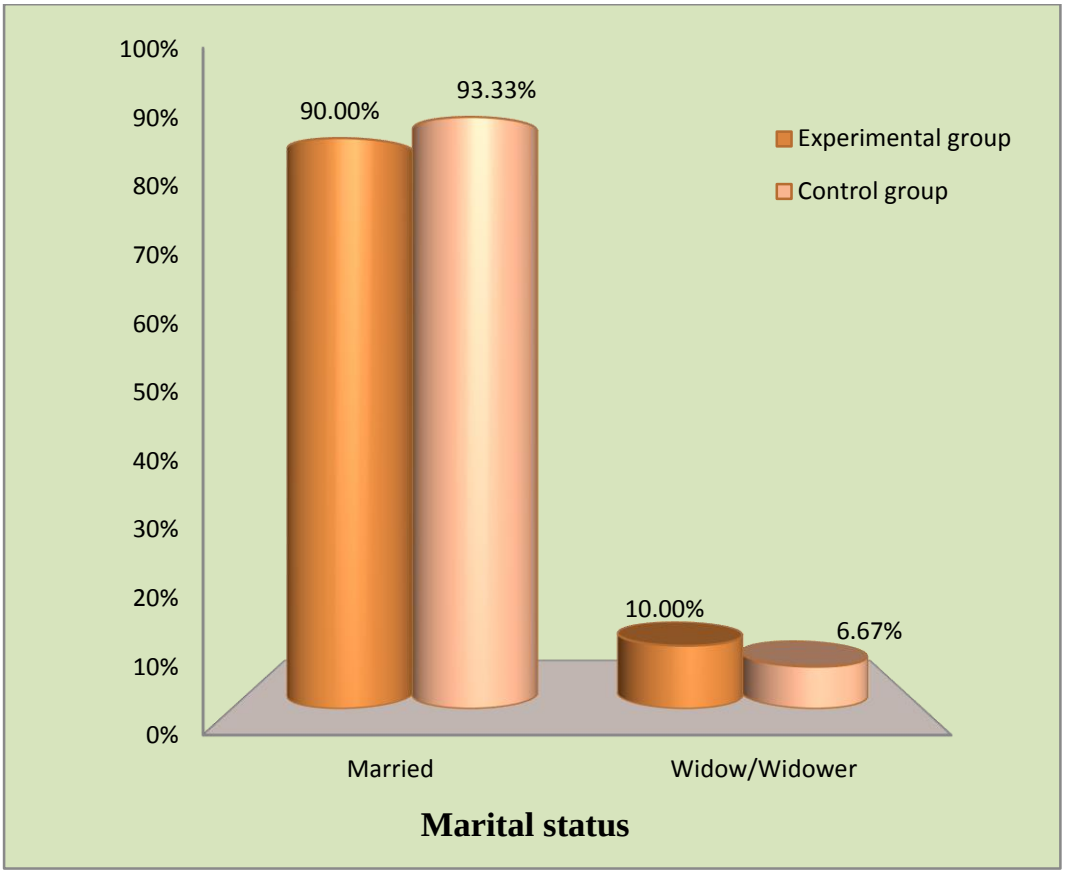

Fig.4.1.3 Percentage distribution of samples according to their marital status in experimental and control group

The above figure 4.1.3 portraits that in experimental group, most of the samples 27 (90%) were married. There were 3 (10%) widow/widower.

In control group, most of the samples 28 (93.33%) were married. There were 2 (6.67%) widow/widower.

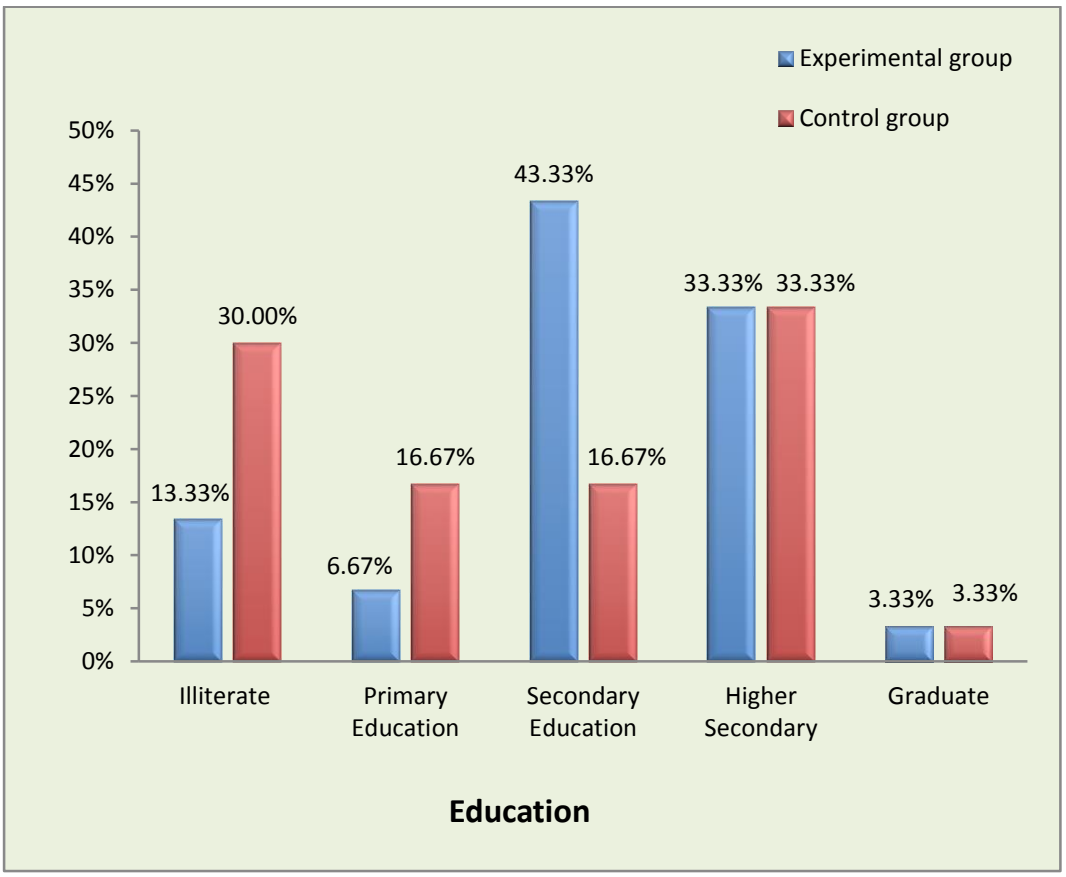

Fig.4.1.4 Percentage distribution of samples according to education in experimental and control group

The above figure 4.1.4 displays that in experimental group, 13 (43.33%) samples had secondary education, 10 (33.33%) samples had higher secondary education, 4 (13.33%) samples were illiterate, 2 (6.67%) samples had primary education and 1 (3.33%) sample was a graduate.

In control group, 10 (33.33%) samples had higher secondary education, 9 (30%) of the samples were illiterate, 5 (16.67%) of the samples had primary education and secondary education respectively and 1 (3.33%) was a graduate.

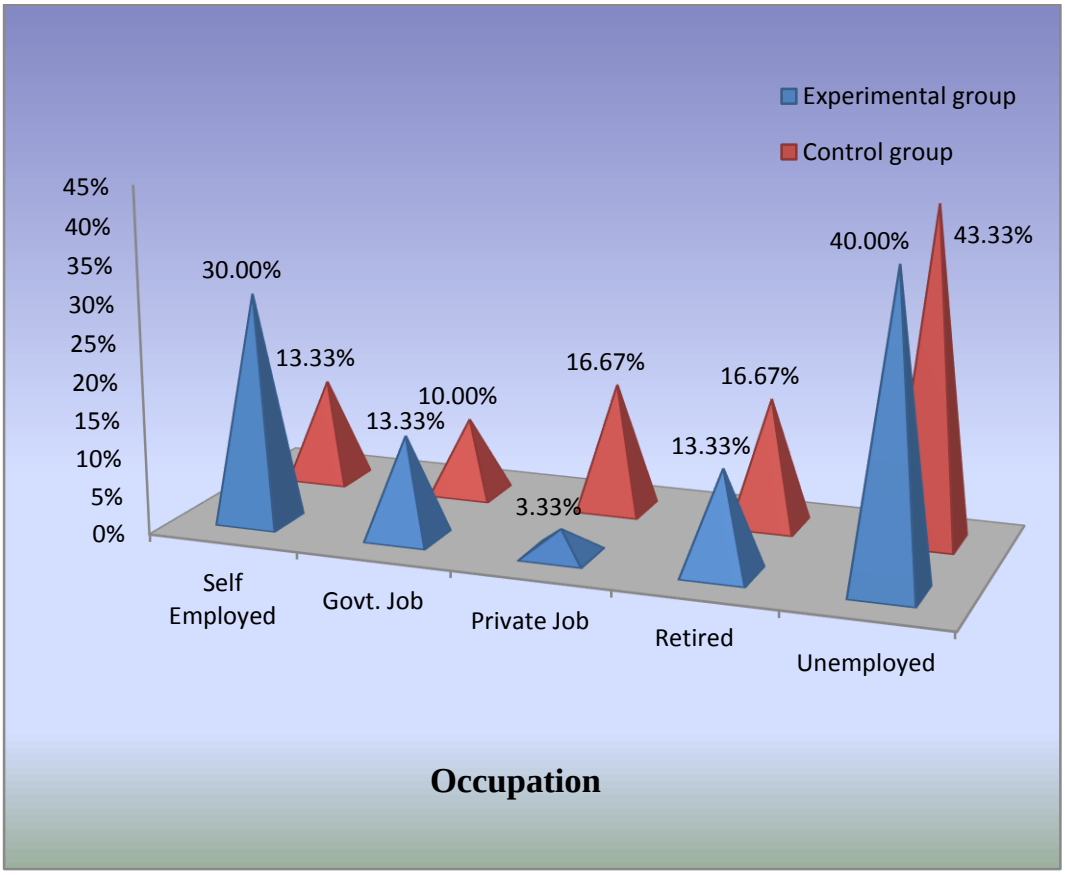

Fig.4.1.5 Percentage distribution of samples according to their occupation in experimental and control group

The above figure 4.1.5 indicates that in experimental group, 12 (40%) samples were unemployed, 9 (30%) samples were self-employed, 4 (13.33%) samples were employed in government job and retired respectively and 1 (3.33%) was employed in private job.

In control group, 13 (43.33%) samples were unemployed, 5 (16.67%) samples were employed in private job and retired respectively, 4 (13.33%) samples were self-employed and 3 (10%) samples were employed in government job.

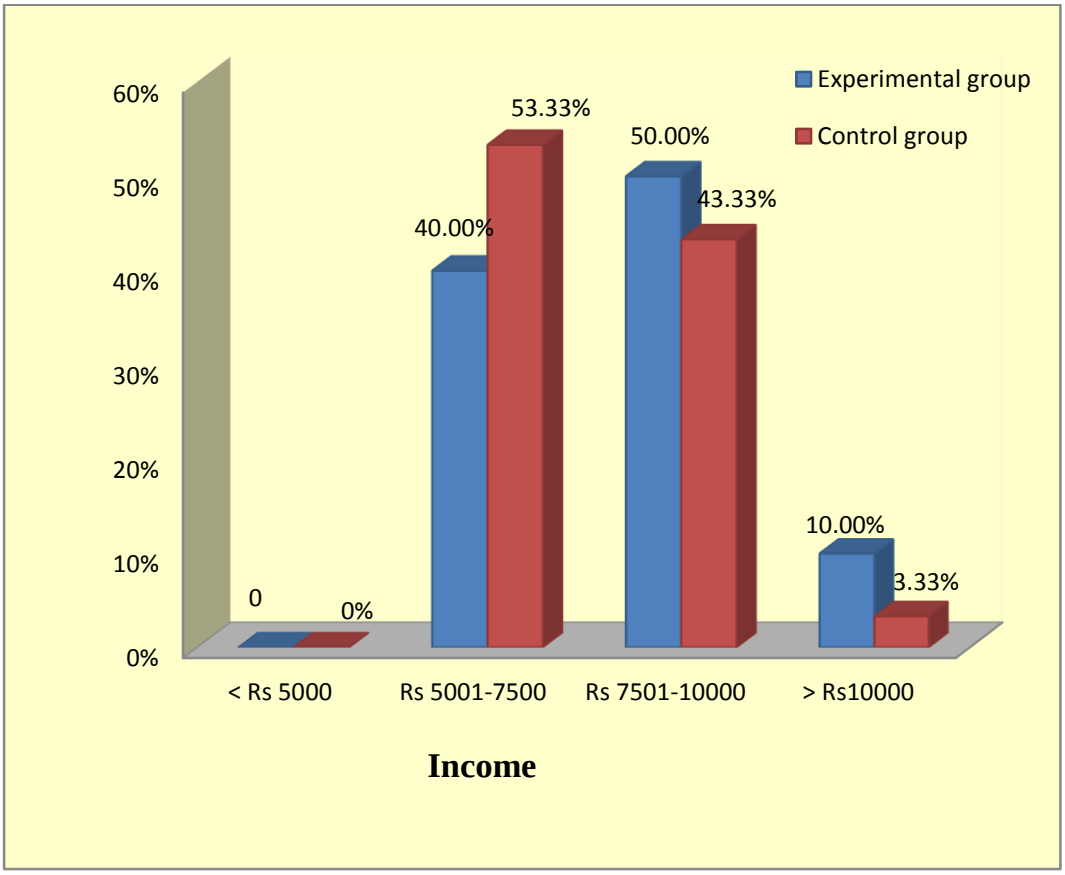

Fig.4.1.6 Percentage distribution of samples according to their income in experimental group and control group

The above figure 4.1.6 reveals that in experimental group, half of the sample 15 (50%) were earning monthly income of Rs 7501-Rs 10000, 12 (40%) samples were earning Rs 5001-Rs 7500, 3 (10%) samples were earning Rs 10000 and above and none of them earned below Rs.5000.

In control group, more than half of the samples 16 (53.33%) were earning monthly income of Rs 5001- Rs 7500, 13 (43.33%) samples were earning Rs7501 - Rs 10000, 1 (3.33%) sample was earning Rs 10000 and above and none of the samples earned below Rs.5000.

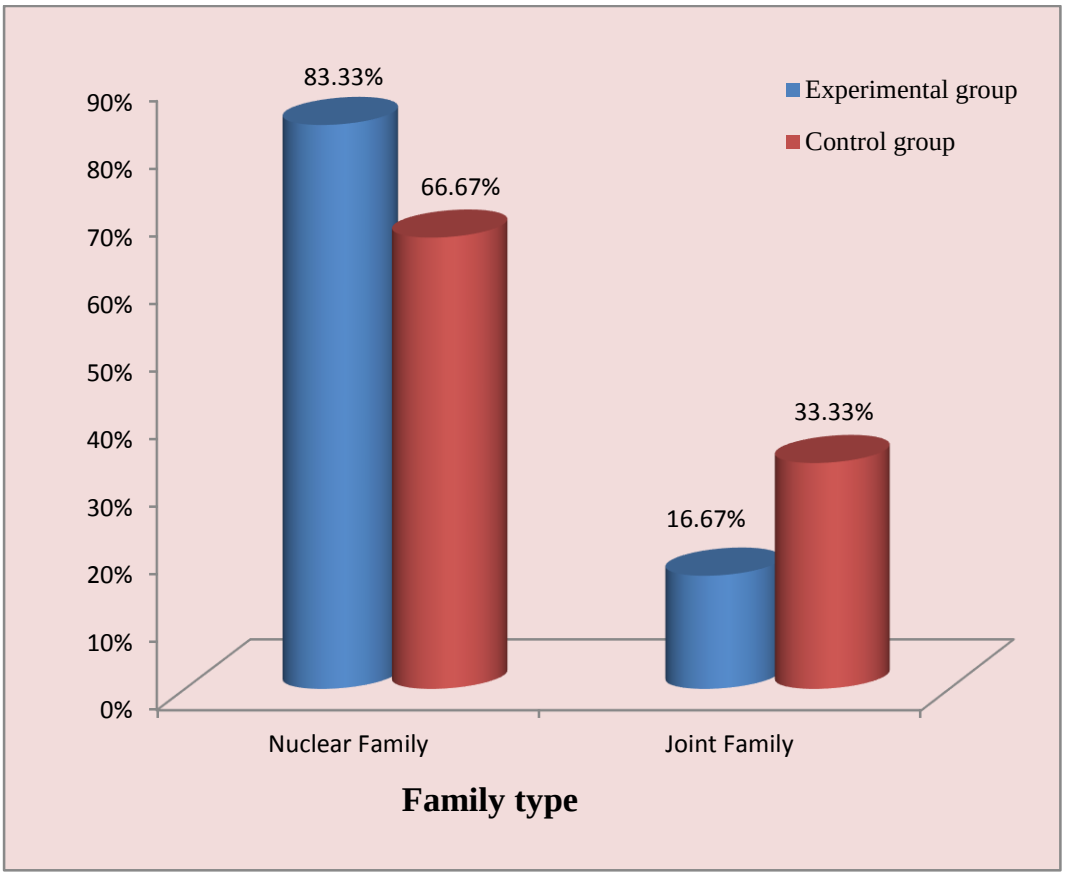

Fig.4.1.7 Percentage distribution of samples according to their family type in experimental and control group

The above figure 4.1.7 reveals that in experimental group, most of the samples 25 (83.33%) belonged to nuclear family and 5 (16.67%) samples belonged to joint family.

In control group, more than half of the samples 20 (66.67%) belonged to nuclear family and 10 (33.33%) samples belonged to joint family.

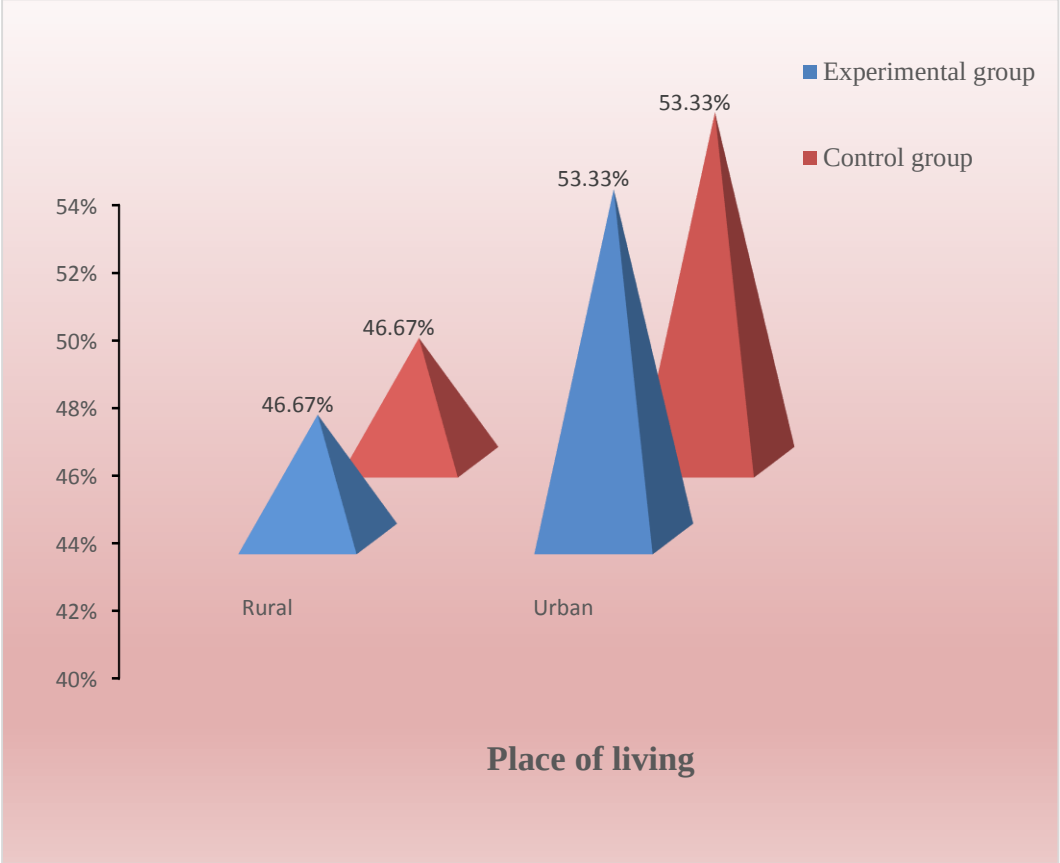

Fig.4.1.8 Percentage distribution of samples according to their place of living in experimental and control group

The above figure 4.1.8 reveals that in experimental group, more than half of the samples 16 (53.33%) were from urban region and 14 (46.67%) samples were from rural area.

In control group, more than half of the samples 16 (53.33%) were from urban region and 14 (46.67%) samples were from rural area.

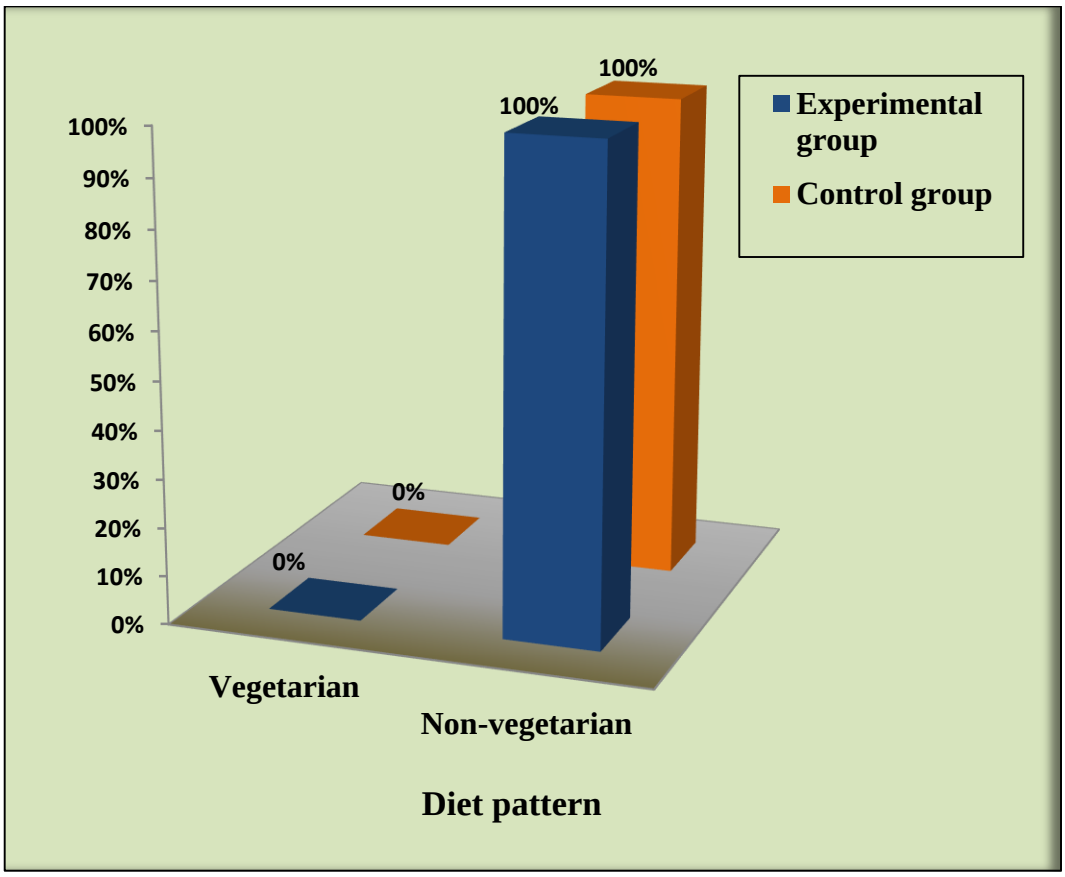

Fig.4.1.9. Percentage distribution of samples according to their diet pattern in experimental and control group

The above figure 4.1.9 depicts that in experimental and control group all the samples 30 (100%) were Non-vegetarians.

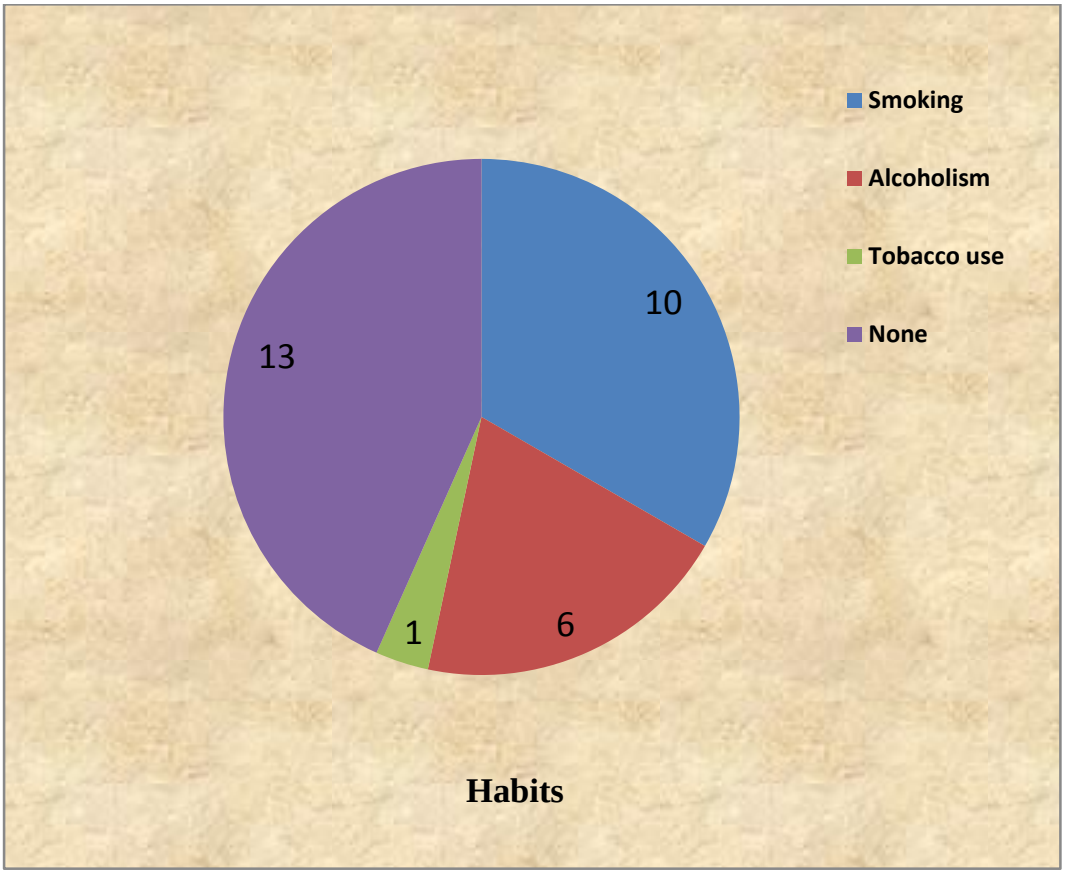

Fig.4.1.10 Frequency distribution of samples according to their habits in experimental group

The above figure 4.1.10 reveals that in experimental group, 10 (33.33%) samples were smokers, 6 (20%) samples were alcoholic and 1 (3.33%) used tobacco whereas 13 (43.34%) samples had none of the above habits.

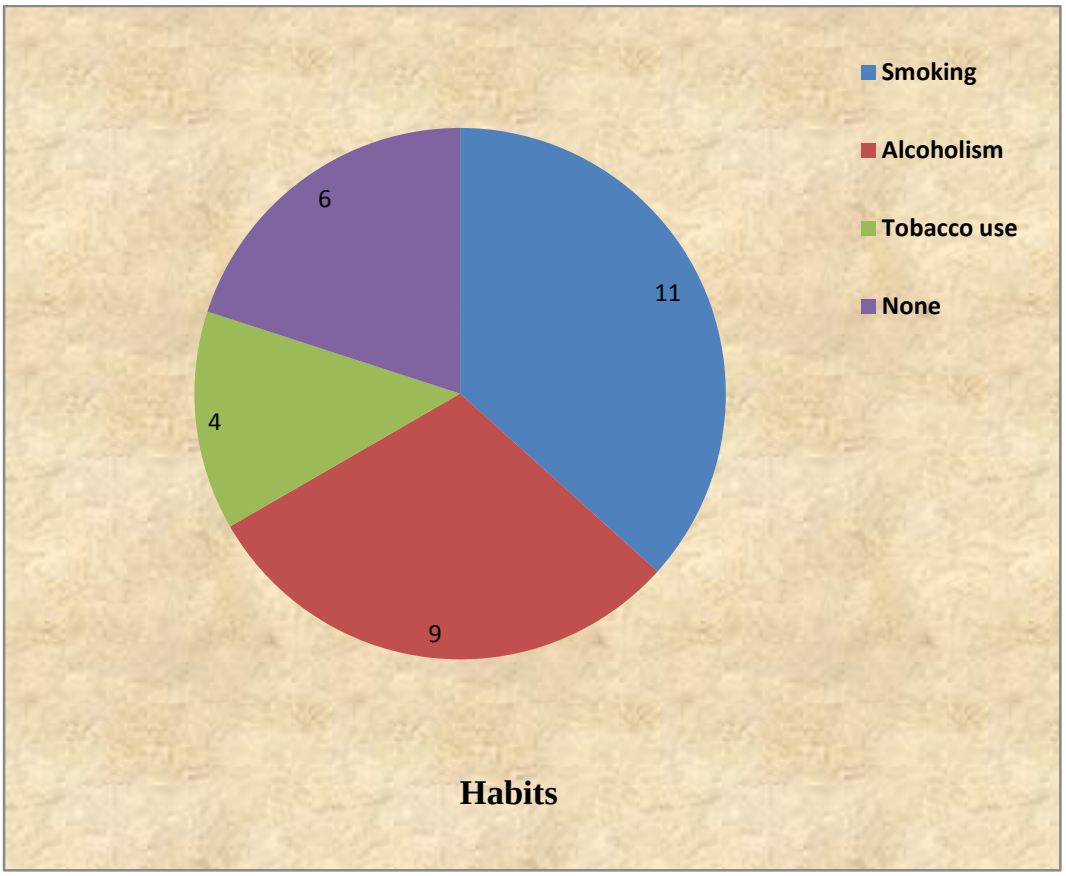

Fig.4.1.11 Frequency distribution of samples according to their habits in control group

The above figure 4.1.10 reveals that in control group, 11 (36.67%) samples were smokers, 9 (30%) samples were alcoholic and 4 (13.33%) used tobacco whereas 6 (20%) samples had none of the above habits.

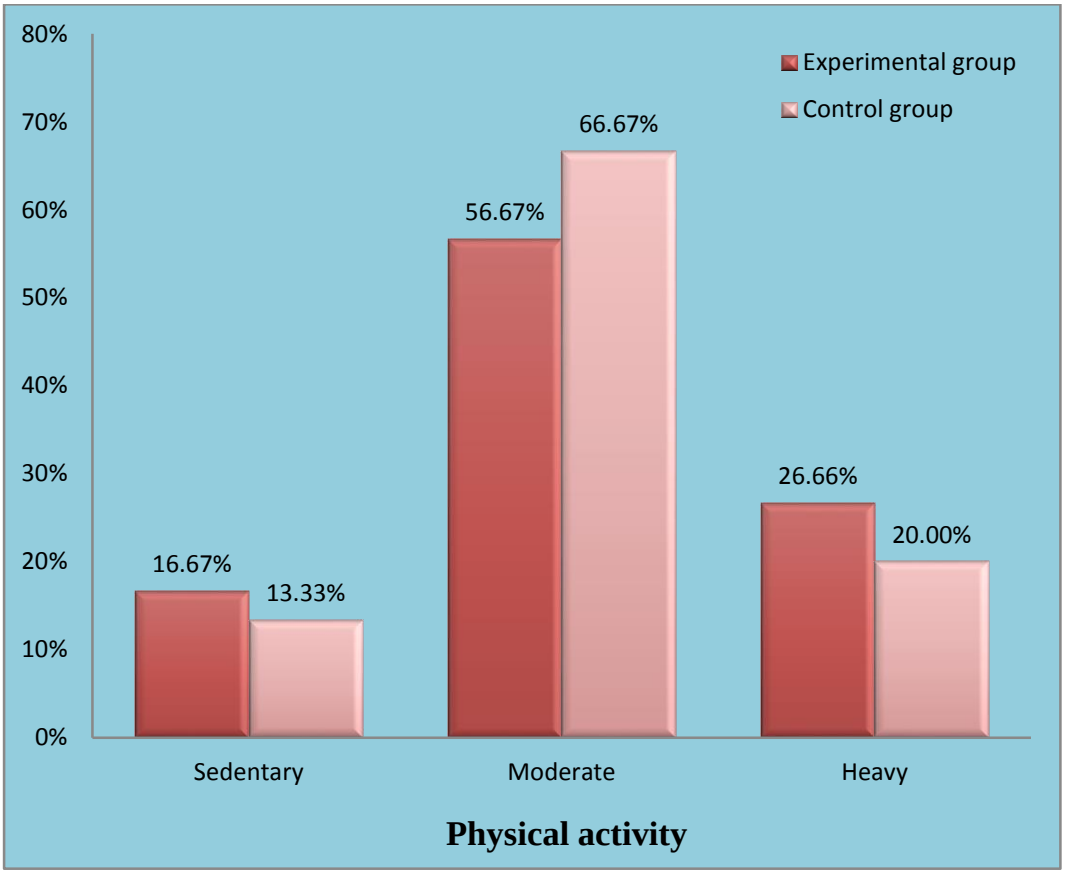

Fig.4.1.12 Percentage distribution of samples according to physical activity in experimental and control group

The above figure 4.1.12 shows that in experimental group, 17 (56.67%) samples had moderate physical activity, 8 (26.66%) samples had heavy physical activity and 5(16.67%) samples had sedentary physical activity.

In control group, majority of the samples 20 (66.67%) had moderate physical activity, 6 (20%) samples had heavy physical activity and 4(13.33%) samples had sedentary physical activity.

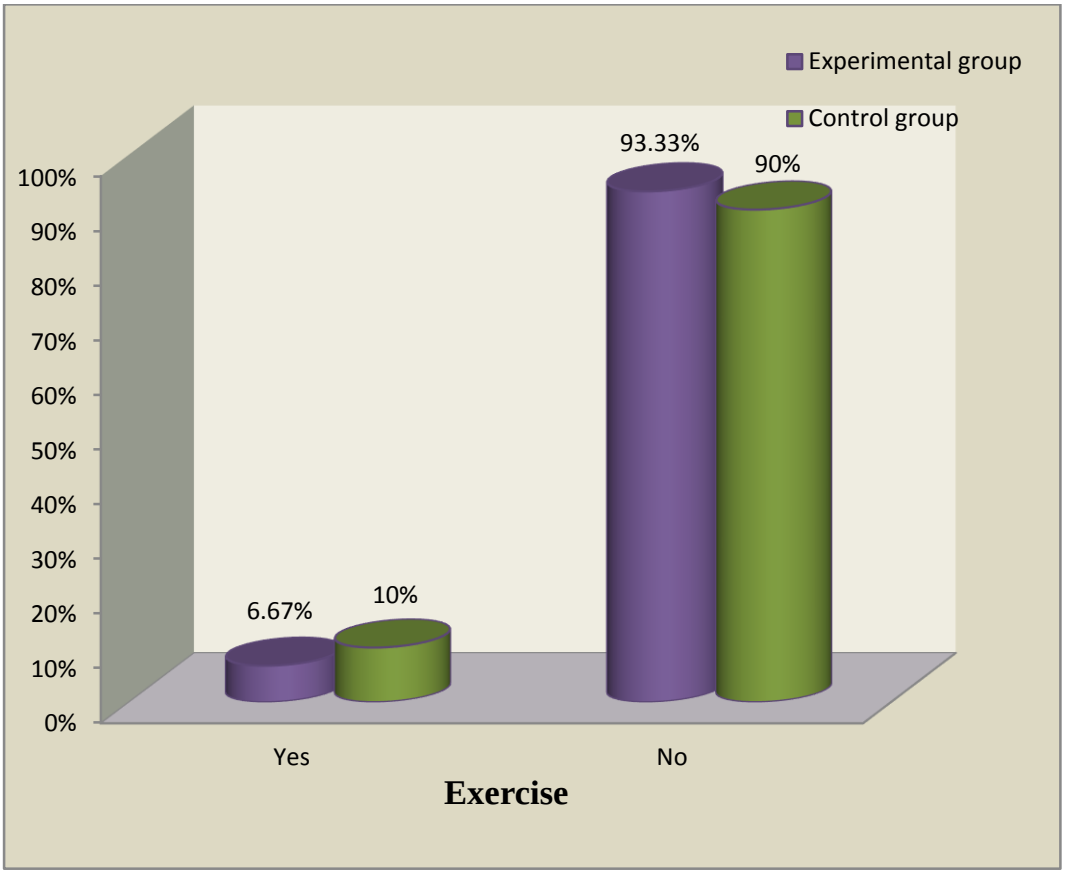

Fig.4.1.13 Percentage distribution of samples according to their exercise pattern in experimental and control group

The above figure 4.1.13 reveals that in experimental group, nearly all samples 28 (93.33%) did not do any exercise and only 2 (6.67%) samples did regular exercise.

In control group, majority of the samples 27(90%) did not do any exercise and only 3 (10%) samples did regular exercise.

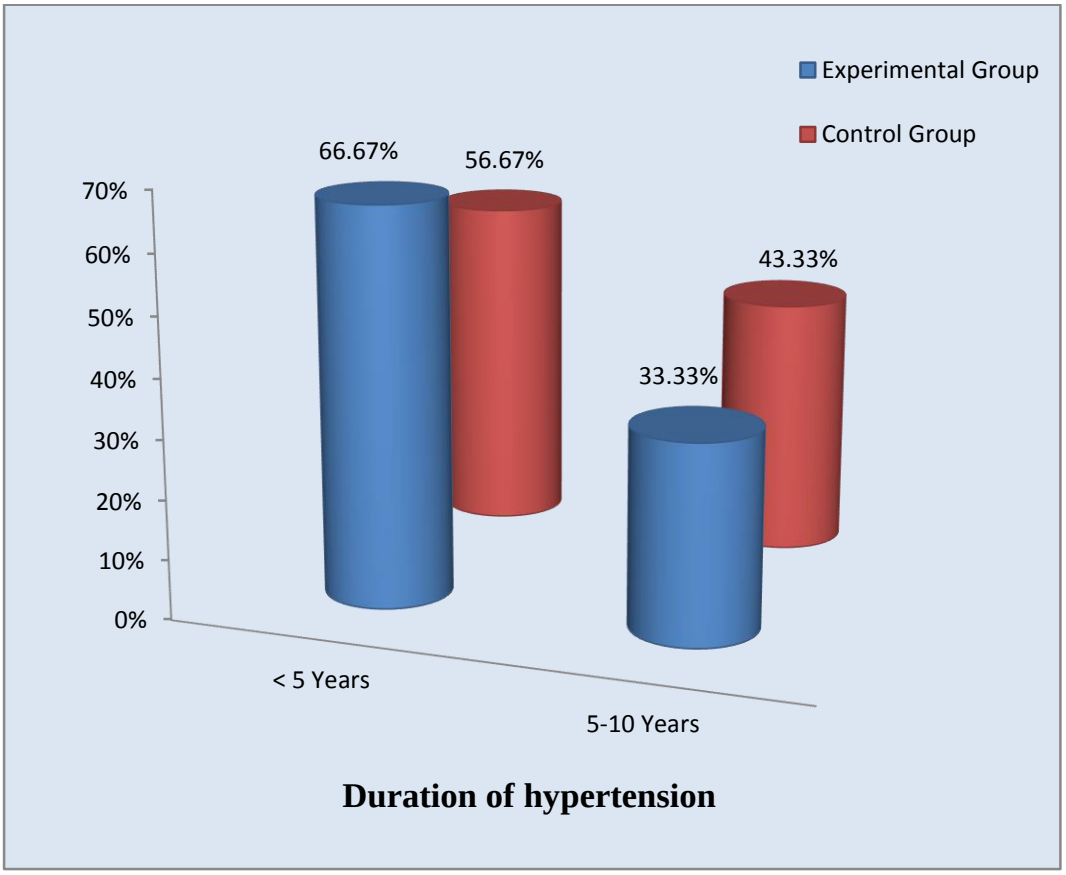

Fig.4.1.14 Percentage distribution of samples according to the duration of hypertension in experimental and control group

The above figure 4.1.14 reveals that in experimental group, more than half of the samples 20 (66.67%) had hypertension for a period of less than 5 years and 10 (33.33%) samples had hypertension for a period between 5 and 10 years.

In control group, more than half of the samples 17 (56.67%) had hypertension for a period of less than 5 years and 13 (43.33%) samples had hypertension for a period between 5 and 10 years.

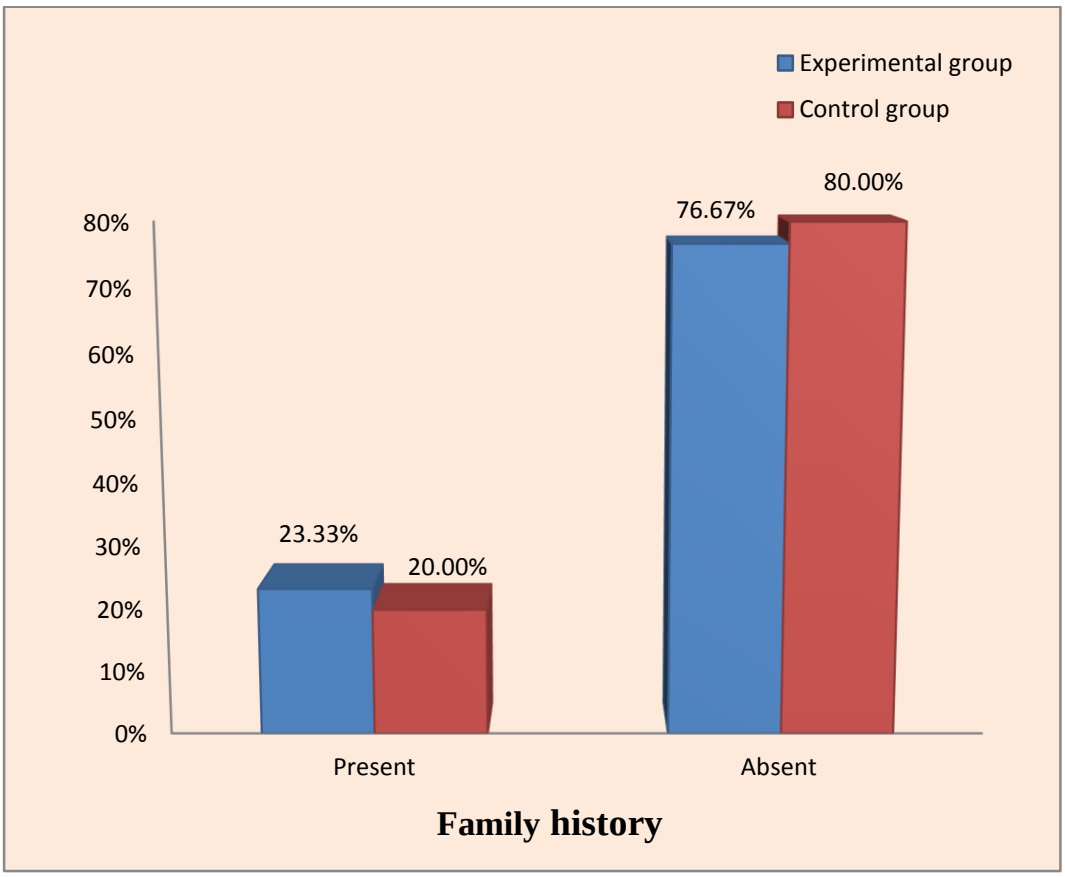

Fig.4.1.15. Percentage distribution of samples according to their family history in experimental and control group

The above figure 4.1.15 displays that in experimental group, most of the samples 23 (76.67%) had no family history of hypertension and 7(23.33%) samples had family history of hypertension.

In control group, most of the samples 24 (80%) had no family history of hypertension and 6 (20%) samples had family history of hypertension.

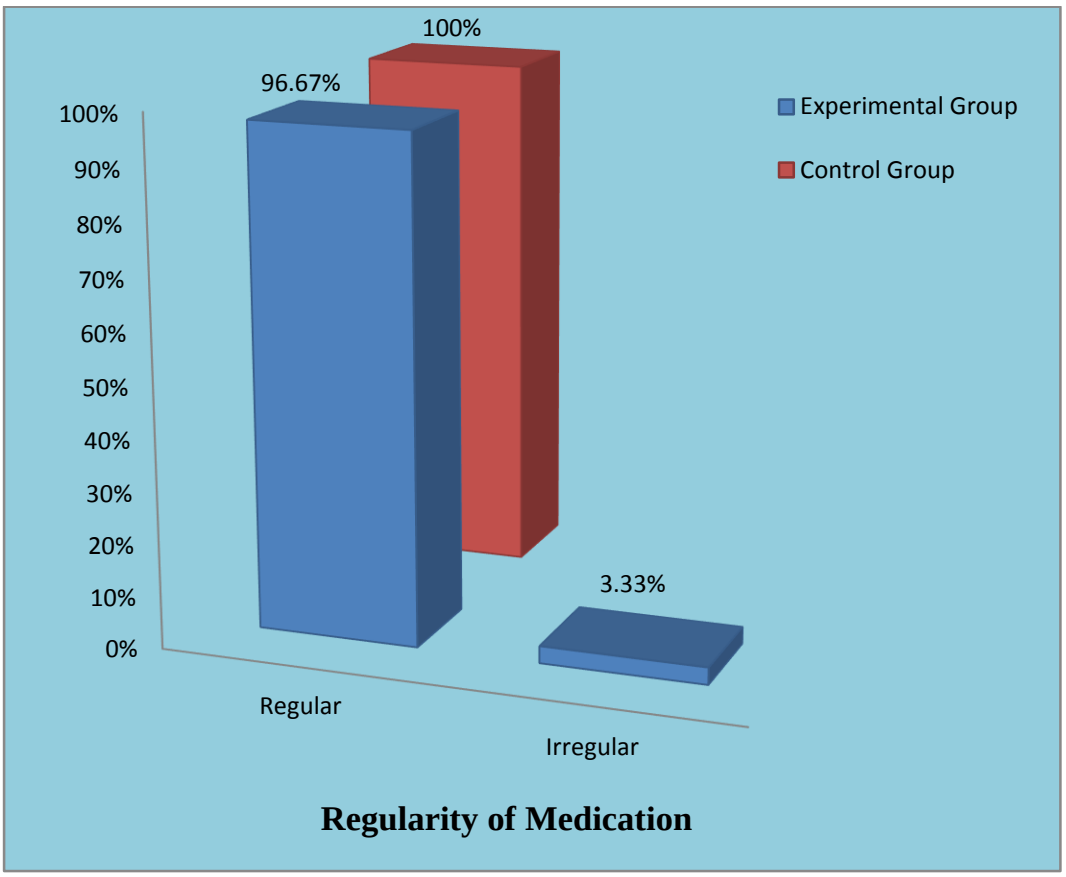

Fig.4.1.16. Percentage distribution of samples according to the regularity of medication in experimental and control group

The above figure 4.1.16 displays that in experimental group, nearly all samples 29 (96.67%) took regular medication and 1(3.33%) sample did not take regular medication.

In control group, all the samples 30(100%) took regular medication.

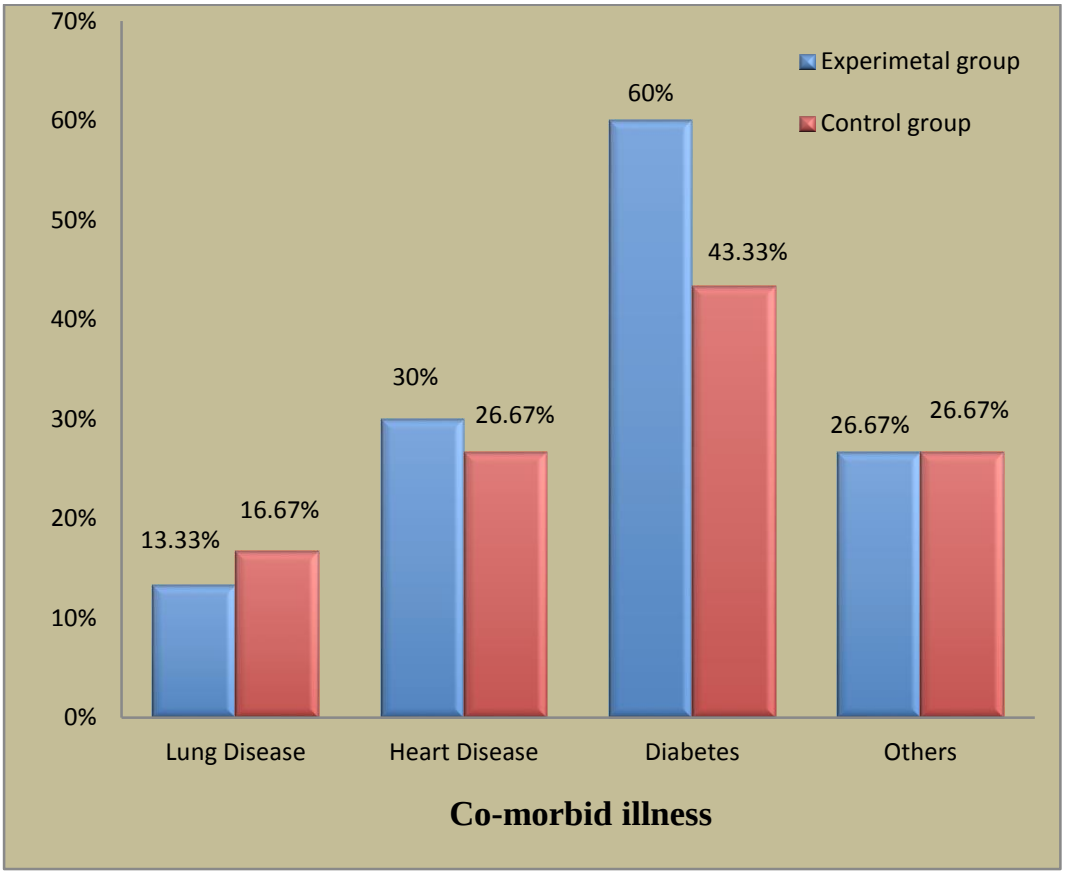

Fig.4.1.17. Percentage distribution of samples according to the co-morbid illness in experimental and control group

The above figure 4.1.17 displays that in experimental group, 18 (60%) samples suffered from diabetes, 9 (30%) samples suffered from heart diseases, 8(26.67%) samples suffered from other diseases and 4 (13.33%) samples suffered from lung diseases,.

In control group, 13 (43.33%) samples suffered from diabetes, 8(26.67%) samples suffered from heart diseases, 8(26.67%) samples suffered from other diseases and 5 (16.67%) samples suffered from lung diseases.

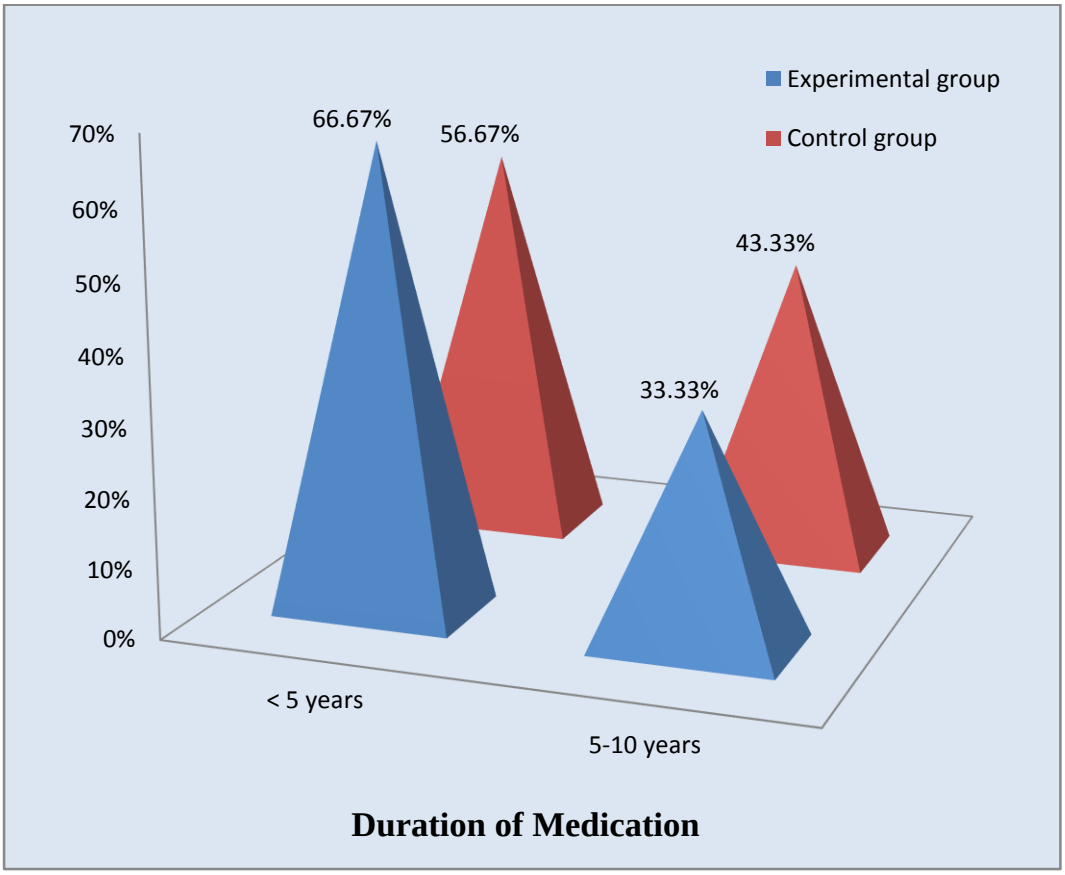

Fig.4.1.18. Percentage distribution of samples according to the medication duration in experimental and control group

The above figure 4.1.18 displays that in experimental group, 20 (66.67%) samples took medication for less than five years and 10 (33.33%) samples took medication between 5 and 10 years.

In control group, 17(56.67%) samples took medication for less than five years and 13 (43.33%) samples took medication between 5 and 10 years.

SECTION B

Comparison of mean and standard deviation of blood pressure level among patients with hypertension during pre and post-test in Experimental and control group

Table 4.2

Mean, Standard deviation and Mean difference in pre-test and post-test among samples in experimental and control group

n=60

Group			Pre test		Post test		Mean difference
			Mean	SD	Mean	SD	
Blood pressure Level	Experimental group	SBP	139.4	5.89	134.73	3.33	4.67
		DBP	90.4	1.2	81.33	2.60	9.07
	Control group	SBP	137.8	4.94	138.47	4.49	0.45
		DBP	90.2	0.6	91.07	0.99	0.39

The above table 4.2 shows the comparison of mean and standard deviation of pre and post test scores among experimental and control group. In Pre-test the mean and the standard deviation of systolic blood pressure was 139.4 ± 5.89 in the experimental group and 137.8 ± 4.94 in the control group respectively.

In Pre-test the mean and the standard deviation of diastolic blood pressure was 90.4 ± 1.2 in the experimental group and 90.2 ± 0.6 in the control group respectively.

In Post-test the mean and the standard deviation of systolic blood pressure was 134.73 ± 3.33 in the experimental group and 138.47 ± 4.49 in the control group respectively.

In Post-test the mean and the standard deviation of diastolic blood pressure was 81.33 ± 2.60 in the experimental group and 91.07 ± 0.99 in the control group respectively.

The mean difference of systolic blood pressure is 4.67 and 0.45 and that of diastolic blood pressure is 9.07 and 0.39 in experimental and control group respectively.

SECTION C

Testing hypotheses

a) Effectiveness of foot reflexology on blood pressure score among experimental group

Table 4.3

Paired‘t’ test value of pre and post test blood pressure scores among experimental group

n=30

Experimental group		Mean	SD	Paired ‘t’ Value	df
SBP	**Pre test**	139.4	5.89	**5.89	29
	Post test	134.73	3.33		
DBP	**Pre test**	90.4	1.2	**20.79	
	Post test	81.33	2.60		

Table value = 2.46 ****Highly Significant at p≤0.01**

The above table 4.3 portraits the paired ‘t’ test value which was calculated to analyse the effectiveness of foot reflexology on blood pressure level among experimental group. The calculated ‘t’ value 5.89 was greater than the table value t = 2.46 at p≤0.01. It shows that foot reflexology was effective on reducing the high blood pressure among the patients with hypertension. Hence, the hypothesis H_1 is retained.

b) Effectiveness of foot reflexology on blood pressure among experimental and control group

Table 4.4

Unpaired‘t’ test value of post-test blood pressure scores of experimental and control group

n=60

Blood Pressure	Group	Mean	SD	Unpaired ‘t’ value	df
SBP	Experimental Group	134.73	3.33	3.6	58
	Control Group	138.47	4.49		
DBP	Experimental Group	81.33	2.60	18.85	
	Control Group	91.07	0.99		

Table value =2.39 ****Highly Significant p≤0.01**

The above table 4.4 depicts the unpaired‘t’ test value 3.6 for systolic blood pressure was greater than the table value 2.39 at p≤0.01. The calculated‘t’ value 18.85 for diastolic blood pressure was greater than the table value 2.39 at p≤0.01. It shows that foot reflexology was effective in controlling the blood pressure among the patients with hypertension. Hence, the hypothesis H_2 is retained.

c) Association between the blood pressure scores and their selected demographic variables

Table 4.5

Association between the pre-test blood pressure scores and their selected demographic variables in the experimental group and control group

n=60

S.No	Demographic Variables	Experimental group n=30				Control group n=30			
		Pre-test		Post-test		Pre-test		Post-test	
		SBP	DBP	SBP	DBP	SBP	DBP	SBP	DBP
1	Age	0.4	2.39	0.74	3.33	1.46	1.75	5.22	***0.04**
2	Sex	0.62	0.74	***0.03**	2.95	0	3.81	0.01	0.12
3	Marital status	0.23	0.36	***0.02**	***0.18**	0	0.23	0.17	0.02
4	Educational status	12.02	12.21	***11.5**	***6.48**	1.52	3.83	3.72	5.49
5	Occupation	6.92	1.59	***3.07**	3.44	2.44	2.53	5	3.92
6	Income	1.62	0.55	***0.23**	4.01	1.08	2.92	1.31	***1.19**
7	Family type	0.43	0.67	***0.02**	1.83	2.4	1.67	***0.29**	***1.07**
8	Place of living	1.16	0.55	***0.74**	***0.39**	0	3.17	0.74	0.15
9	Habit	0.95	0.72	1.17	5.76	1.04	11.03	***0.56**	***0.46**
10	Physical activity	3.16	0.68	***1.85**	1.89	0.86	0.74	4.66	1.73
11	Exercise	1.85	0.23	***1.23**	6.97	3.34	2.01	***1.3**	***0.23**
12	Duration of Hypertension	4.3	6.66	***2.17**	***2.34**	1.22	0.74	2.9	***0.62**
13	Family history	0.06	1.01	0.25	***0.96**	0	0.72	0.57	0.03
14	Regularity of medication	1.17	0.11	***0.62**	0.29	-	-	-	-
15	Co-morbid illness	5.6	1.88	***5.01**	***0.92**	3.29	1.35	***0.45**	***1.16**
16	Duration of Medication	4.3	6.66	***2.17**	***2.34**	1.22	0.74	2.9	***0.62**

***Significant**

The table 4.5 displays that in the experimental group, with regard to systolic blood pressure there was a significant association found between sex, marital status, education, occupation, income, family type, place of living, physical activity, exercise, duration of hypertension, regularity of medication, co-morbid illness and duration of medication whereas age, habit and family history were not associated. Hence, the hypothesis H_3 is accepted for the above mentioned variables and rejected for age, habit and family history. With regard to diastolic blood pressure, there was a significant association found between marital status, education, place of living, duration of hypertension, family history, co-morbid illness and medication duration whereas, age, sex, occupation, income, family type, habit, physical activity, exercise and regular medication were not associated. Hence, the hypothesis H_3 is accepted for the above mentioned variables and rejected for age, sex, occupation, income, family type, habit, physical activity, exercise and regular medication.

In the control group, with regard to systolic blood pressure there was a significant association found between family type, habit, exercise and co-morbid illness whereas, age, sex, marital status, education, occupation, income, place of living, physical activity, duration of hypertension, family history, regular medication and medication duration were not associated. Hence, the hypothesis H_3 is accepted for the above mentioned variables and rejected for age, sex, marital status, education, occupation, income, place of living, physical activity, duration of hypertension, family history, regular medication and medication duration. With regard to diastolic blood pressure there was a significant association found between age, income, family type, habit, exercise, duration of hypertension, co-

morbid illness and medication duration whereas, sex, marital status, education, occupation, place of living, physical activity, family history and regular medication were not associated. Hence, the hypothesis H_3 is accepted for the above mentioned variables and rejected for sex, marital status, education, occupation, place of living, physical activity, family history and regular medication.

Summary

This chapter dealt with data analysis and interpretation in the form of statistical value based on the objectives. Paired and unpaired‘t’ test was used to evaluate the effectiveness of foot reflexology on high blood pressure. Chi square test was used to find out the association between the pre and post-test blood pressure among patients with Hypertension with their selected demographic variables in experimental and control group.

CHAPTER V
DISCUSSION

The study focused on evaluating the effectiveness of Foot Reflexology on Blood pressure scores among patients with hypertension at selected hospital, Coimbatore. This chapter presents the main findings and its discussion. This research Study has been discussed based on the objectives and the following supported studies.

Baseline Characteristics of Experimental and Control Group

Demographic variables:

In experimental group, 14 (46.67%) samples belong to the age group of 51 to 60 years, 17 (56.67%) samples were female, most of the samples 27 (90%) were married, 13 (43.33%) samples had secondary education, 12 (40%) samples were unemployed, half of the sample 15 (50%) samples were earning monthly income of Rs 7501-Rs 10000, most of the samples 25 (83.33%) belonged to nuclear family, more than half of the samples 16 (53.33%) were from urban region, all the samples 30 (100%) were Non-vegetarians, 10 samples (33.33%) were smokers, 6 samples (20%) were alcoholic and 1 (3.33%) used tobacco, 17(56.67%) samples had moderate physical activity, nearly all samples 28 (93.33%) did not do any exercise, more than half of the samples 20 (66.67%) had hypertension for a period of less than 5 years, most of the samples 23 (76.67%) had no family history of hypertension, nearly all samples 29 (96.67%) took regular medication, 4 (13.33%) samples suffered from lung diseases, 9 (30%) samples suffered from heart diseases, 18 (60%) samples suffered from diabetes and 8 (26.67%) samples suffered from other diseases and most of the samples 20 (66.67%) took medication for less than five years.

In control group, 13 (43.33%) samples were in the age group of 61 to 70 years, 16 (53.33%) samples were male, most of the samples 28 (93.33%) were married, 10 (33.33%) samples had higher secondary education, 13 (43.33%) samples were unemployed, more than half of the samples 16 (53.33%) were earning monthly income of Rs 5001- Rs 7500, more than half of the samples 20 (66.67%) belonged to nuclear family, more than half of the samples 16 (53.33%) are from urban region, all the samples 30 (100%) were Non-vegetarians, 11 (36.67%) samples were smokers, 9 (30%) samples were alcoholic and 4 (13.33%) samples used tobacco, majority of the samples 20 (66.67%) had moderate physical activity, majority of the samples 27 (90%) did not do any exercise, more than half of the samples 17 (56.67%) had hypertension for a period of less than 5 years, most of the samples 24 (80%) had no family history of hypertension, all samples 30 (100%) took regular medication, 5 (16.67%) samples suffered from lung diseases, 8 (26.67%) samples suffered from heart diseases, 13 (43.33%) samples suffered from diabetes and 8 (26.67%) samples suffered from other diseases and more than half of the samples 17 (56.67%) took medication for less than five years.

Jasvir Kaur, Sukhpal Kaur, Neerja Bhardwaj (2011) conducted a study to assess the effect of foot massage and reflexology on physiological parameters of critically ill patients in Chandigarh. 60 patients admitted in various ICUs of Nehru hospital were selected for the study. Similar to the present study, this study was consistent with the demographic variables. According to age, the mean age (yrs) ±SD of the subjects was 46.7±16.1, with the range of 16-80 yrs. Around one third (31.6%) were between 31-45 years. Majority (70%) were male. 30% were illiterate. 28.3% were self-employed. Around half (53.3%) of the subjects had 1-5 family members in their families.

Findings based on the Objectives

The first objective was to assess the blood pressure of patients with hypertension in experimental and control group.

In pre-test the mean systolic blood pressure was 139.4 ± 5.89 in the experimental group and 137.8 ± 4.94 in the control group.In pre-test the mean diastolic blood pressure was 90.4 ±1.2 in the experimental group and 90.2±0.6 in the control group.In post-test the mean systolic blood pressure was 134.73±3.33 in the experimental group and 138.47± 4.49 in the control group. In post-test the mean and the standard deviation of diastolic blood pressure was 81.33± 2.60 in the experimental group and 91.07± 0.99 in the control group. The mean difference of systolic blood pressure was 4.67 and that of diastolic blood pressure was 9.07 in experimental group. The mean difference of systolic blood pressure was 0.45 and that of diastolic blood pressure was 0.39 in control group.

Kokiwar Prashant (2011) conducted a community based cross sectional survey to study the prevalence of hypertension and to study the association between various factors and hypertension in a rural community of Central India. 924 study subjects aged 30 years and above were selected using random sampling. Anthropometry, blood glucose, and blood pressure were measured with standard instruments. Statistical tests were used to analyze the data wherever applicable. The result showed that the prevalence of hypertension was 19.04%. It was higher in females (23.4%) than males (14.4%). It was seen that prevalence of hypertension increased with age. Prevalence of Pre hypertension was high (18.8%). 4.3% had isolated systolic hypertension and 0.9% had isolated diastolic hypertension. Older age, increased body mass index and waist hip ratio were significantly higher among hypertensive compared to normotensive. Factors like

upper social class, sedentary physical activity, tobacco use and diabetes were significantly associated with hypertension. It was concluded that the prevalence of hypertension was high and was associated with socio-demographic factors. Hence there was need for primordial prevention efforts on large scale.

Second objective of this study was to evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension in experimental group.

Among the experimental group, in pre-test, the mean systolic blood pressure was 139.4±5.89 and that of diastolic blood pressure was 90.4±1.2.In post-test, the mean of systolic blood pressure was 134.73±3.33 and that of diastolic blood pressure was 81.33±2.60. The test of significance was calculated using paired‘t’ test. The calculated‘t’ value for systolic blood pressure was 5.89 and that of diastolic blood pressure was 20.79 were greater than the table value (t = 2.46) at $p \leq 0.01$. It showed that foot reflexology was effective in reducing the high blood pressure among the patients with hypertension. Hence, the hypothesis $H_1$was retained.

The mean post-test value of systolic blood pressure was 134.73±3.33 and 138.47±4.49 in the experimental and control group respectively. The mean post-test value of diastolic blood pressure was 81.33±2.60 and 91.07±0.99 in the experimental and control group respectively. The calculated unpaired ‘t’ values for systolic blood pressure and diastolic blood pressure in experimental and control group were 3.6 and 18.85 respectively. These values were greater than the table value 2.39 at $p \leq 0.01$. It showed that foot reflexology was effective in controlling the blood pressure among the patients with hypertension. Hence, the hypothesis H_2 was retained.

Hughes CM, Krirsnakriengkrai S, Kumar S, McDonough SM, (2011) conducted a randomized controlled trial to study the effect of reflexology on heart rate and blood pressure in United Kingdom. Twenty-six healthy volunteers were grouped into experimental and control group. Participants in the reflexology group received 20 minutes of reflexology, and the control group received 20 minutes of relaxation with a therapist holding each participant's feet. The outcome measures, HR and BP, were measured throughout. There were significant reductions in systolic blood pressure (SBP) (22%; P =.03) and in diastolic blood pressure (DBP) (26%; P =.01) during mental stress following reflexology compared to the stress period prior to intervention. In contrast, there was a 10% reduction in SBP (P =.03) but a 5% increase in DBP (P =.67) during the period of mental stress following the control intervention compared to results obtained during mental stress prior to this intervention. This study has demonstrated the feasibility of conducting an experimental study on the effect of reflexology in stress using BP as the primary outcome measure.

The third objective of this study was to associate the pre and post-test blood pressure scores among samples with their selected demographic variables in both experimental group and control group.

In the experimental group, with regard to systolic blood pressure there was a significant association found between sex, marital status, education, occupation, income, family type, place of living, physical activity, exercise, duration of hypertension, regularity of medication, co-morbid illness and duration of medication whereas age, habit and family history were not associated. Hence, the hypothesis H_3 is accepted for the above mentioned variables and rejected for age, habit and family history. With regard to diastolic blood pressure, there was a significant association found between marital status, education, place of living, duration of hypertension, family history, co-morbid illness and medication duration whereas, age, sex, occupation, income, family type, habit, physical activity, exercise and regular medication were not associated. Hence, the hypothesis H_3 is accepted for the above mentioned variables and rejected for age, sex, occupation, income, family type, habit, physical activity, exercise and regular medication.

In the control group, with regard to systolic blood pressure there was a significant association found between family type, habit, exercise and co-morbid illness whereas, age, sex, marital status, education, occupation, income, place of living, physical activity, duration of hypertension, family history, regular medication and medication duration were not associated. Hence, the hypothesis H_3 is accepted for the above mentioned variables and rejected for age, sex, marital status, education, occupation, income, place of living, physical activity, duration of hypertension, family history, regular medication and medication duration. With

regard to diastolic blood pressure there was a significant association found between age, income, family type, habit, exercise, duration of hypertension, co-morbid illness and medication duration whereas, sex, marital status, education, occupation, place of living, physical activity, family history and regular medication were not associated. Hence, the hypothesis H_3 is accepted for the above mentioned variables and rejected for sex, marital status, education, occupation, place of living, physical activity, family history and regular medication.

Summary

This chapter dealt with the discussion of the study with the reference to the objective and supportive studies. All the three objectives have been obtained and the three hypotheses were tested.

CHAPTER VI
SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter deals with the summary of the study and conclusions drawn. It also clarifies the implications for different areas like nursing practice, nursing education, nursing research, nursing administrations and recommendations for further research.

Summary of the Study

Hypertension is defined as an average systolic blood pressure above 140 mm Hg, and a diastolic blood pressure above 90 mm Hg or both. The first line of treatment for hypertension includes dietary changes, physical exercise, and weight loss. Reflexology helps overall circulation in the body and it helps to reduce the blood pressure. Hypertension is one of the conditions purported to be improved by complementary therapies such as foot reflexology.

The investigator conducted a study to evaluate the effectiveness of Foot Reflexology on Blood Pressure level among patients with hypertension at selected hospital, Coimbatore.

The objectives of the study were,

1. To assess the blood pressure of patients with hypertension in experimental and control group.
2. To evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension in experimental group.
3. To associate the pre and post-test blood pressure scores of patients with hypertension with their selected demographic variables.

The following hypotheses were tested:

H_1: There will be significant difference in the pre and post-test level of blood pressure among samples in experimental group.

H_2: There will be significant difference between the post-test level of blood pressure among samples of experimental and control group.

H_3: There will be significant association between the level of blood pressure among samples and their selected demographic variables in both experimental and control group.

The study was conducted in the in-patient department of Kongunad Hospital, Coimbatore. Kongunad Hospital is a 250 bedded Multi-speciality hospital with all infrastructure resources. The hospital receives an average of 200-210 patients every day. The average number of hypertension patients in the ward is about 15-20 patients per day. The research approach used in the study was quantitative evaluative approach. The quasi experimental study with pre-test post-test control group design and non-probability purposive sampling technique was used for the present study. The sample size for this study was 60 patients with hypertension (30 samples in experimental group; 30 samples in control group). Structured interview schedule was used to collect baseline data and calibrated sphygmomanometer was used to measure the blood pressure level. The content validity and reliability was obtained prior to the study. Subsequently, a pilot study was conducted and was found that, the tool was feasible and practicable. A modified Wiedenbach's Helping Art of Clinical Nursing Theory (1970) was formulated which provided a useful means in assessing the reduction of blood pressure level among the patients with hypertension after the implementation of foot reflexology.

The data collection was done for a period of four weeks from 01.08.2014 to 31.08.2014. Prior to the data collection, permission was obtained from the concerned authorities for conducting the study including ethical committee clearance. Informed verbal consent was obtained from the samples and confidentiality was assured. The investigator collected the baseline data. The data was collected through interview method in Tamil. The observation chart was maintained for a period of 5 days. Routine care was provided to all the samples included in this study. Pre-test blood pressure was taken for all the samples and was noted. Foot reflexology was given for ten minutes on each foot, once daily for 5 consecutive days for those in the experimental group. Post-test blood pressure was taken for all the samples after 30 min duration of the pre-test. Ethical aspects were considered throughout the study. The data was analysed using descriptive and inferential statistics.

Major Findings of the Study

The major findings of the study were summarized as follows

- In experimental group, 14 (46.67%) samples belong to the age group of 51 to 60 years, 17 (56.67%) samples were female, most of the samples 27 (90%) were married, 13 (43.33%) samples had secondary education, 12 (40%) samples were unemployed, half of the sample 15 (50%) of the samples were earning monthly income of Rs 7500-Rs 10000, most of the samples 25 (83.33%) belonged to nuclear family, more than half of the samples 16 (53.33%) were from urban region, all the samples 30 (100%) were non-vegetarians, 10 samples (33.33%) were smokers, 6 samples (20%) were alcoholic and 1 (3.33%) used tobacco, 17 (56.67%) samples

had moderate physical activity, nearly all samples 28 (93.33%) did not do any exercise, more than half of the samples 20 (66.67%) had hypertension for a period of less than 5 years, most of the samples 23 (76.67%) had no family history of hypertension, nearly all samples 29 (96.67%) took regular medication, 4 (13.33%) samples suffered from lung diseases, 9 (30%) samples suffered from heart diseases, 18 (60%) samples suffered from diabetes and 8 (26.67%) samples suffered from other diseases and most of the samples 20 (66.67%) took medication for less than five years.

- In control group, 13 (43.33%) samples were in the age group of 61 to 70 years, 16 (53.33%) samples were male, most of the samples 28 (93.33%) were married, 10 (33.33%) samples had higher secondary education, 13 (43.33%) samples were unemployed, more than half of the samples 16 (53.33%) were earning monthly income of Rs 5001- Rs 7500, more than half of the samples 20 (66.67%) belonged to nuclear family, more than half of the samples 16 (53.33%) are from urban region, all the samples 30 (100%) were non-vegetarians, 11 samples (36.67%) were smokers, 9 samples (30%) were alcoholic and 4 (13.33%) samples used tobacco, majority of the samples 20 (66.67%) had moderate physical activity, majority of the samples 27 (90%) did not do any exercise, more than half of the samples 17 (56.67%) had hypertension for a period of less than 5 years, most of the samples 24 (80%) had no family history of hypertension, all samples 30 (100%) took regular medication, 5 (16.67%) samples suffered from lung diseases, 8 (26.67%) samples suffered from heart diseases, 13 (43.33%) samples suffered from diabetes and 8

(26.67%) samples suffered from other diseases and more than half of the samples 17 (56.67%) took medication for less than five years.

- In Pre-test, the mean and the standard deviation of systolic blood pressure was 139.4 ± 5.89 in the experimental group and 137.8 ± 4.94 in the control group respectively. In Pre-test, the mean and the standard deviation of diastolic blood pressure was 90.4 ± 1.2 in the experimental group and 90.2 ± 0.6 in the control group respectively.
- In Post-test, the mean and the standard deviation of systolic blood pressure was 134.73 ± 3.33 in the experimental group and 138.47 ± 4.49 in the control group respectively. In Post-test, the mean and the standard deviation of diastolic blood pressure was 81.33 ± 2.60 in the experimental group and 91.07 ± 0.99 in the control group respectively. The mean difference of systolic blood pressure was 4.67 and that of diastolic blood pressure was 9.07 in experimental group. The mean difference of systolic blood pressure was 0.45 and that of diastolic blood pressure was 0.39 in control group.
- The paired‘t’ test value which was calculated to analyse the effectiveness of foot reflexology on blood pressure level among experimental group. The calculated‘t’ value 5.89 and 20.79 was greater than the table value t = 2.46 at $p \leq 0.01$. It shows that foot reflexology was effective on reducing the high blood pressure among the patients with hypertension. Hence, the hypothesis H_1 was retained.
- The unpaired‘t’ test which was calculated to analyse the effectiveness of foot reflexology on blood pressure among experimental group. The

calculated‘t’ value 3.6 for systolic blood pressure was greater than the table value 2.39 at $p \leq 0.01$. The calculated‘t’ value 18.85 for diastolic blood pressure was greater than the table value 2.39 at $p \leq 0.01$. It shows that foot reflexology was effective in controlling the blood pressure among the patients with hypertension. Hence, the hypothesis H_2 was retained.

- In the experimental group, with regard to systolic blood pressure there was a significant association found between sex, marital status, education, occupation, income, family type, place of living, physical activity, exercise, duration of hypertension, regular medication, co-morbid illness and medication duration whereas, age, habit and family history were not associated. In the experimental group, with regard to diastolic blood pressure there was a significant association found between marital status, education, place of living, duration of hypertension, family history, co-morbid illness and medication duration whereas, age, sex, occupation, income, family type, habit, physical activity, exercise and regular medication were not associated. Hence, the hypothesis H_3 was accepted for marital status, education, place of living, duration of hypertension, co-morbid illness and medication duration and rejected for age and habit.
- In the control group, with regard to systolic blood pressure there was a significant association found between family type, habit, exercise and co-morbid illness whereas, age, sex, marital status, education, occupation, income, place of living, physical activity, duration of hypertension, family history, regular medication and medication duration were not associated. In the control group, with regard to diastolic blood pressure there was a

significant association found between age, income, family type, habit, exercise, duration of hypertension, co-morbid illness and medication duration whereas, sex, marital status, education, occupation, place of living, physical activity, family history and regular medication were not associated. Hence, the hypothesis H_3 was accepted for family type, habit, exercise and co-morbid illness and rejected for sex, marital status, education, occupation, place of living, physical activity, family history and regular medication.

Conclusion

The study was done to evaluate the effectiveness of foot reflexology on the blood pressure level among patients with hypertension at selected hospital, Coimbatore. The statistical analysis of the study showed that there was decrease in the elevated blood pressure level after implementation of foot reflexology in patients with hypertension when compared with the pre-test. Also there was a difference in the post test blood pressure score among experimental and the control group. Thus this study proved the effectiveness of foot reflexology on the blood pressure level among patients with hypertension.

Implications

The findings of the study have implications in different aspects of nursing profession such as nursing practice, nursing education, nursing research and nursing administration.

Nursing Practice

- Nurses play a vital role in prevention of non-communicable diseases (NCD). The incidence and prevalence of hypertension and its complications are increasing every year. Thus, there is an urgent need to concentrate on the measures to reduce the disease burden.
- Foot Reflexology can be incorporated in the daily nursing routine as it is a proven technique to reduce the elevated Blood Pressure.
- The nursing personnel should be responsible to create awareness in the general public through mass media campaign regarding the importance of foot reflexology as an adjuvant therapy for hypertension and prevent its complications.

Nursing Education

- As Nurse Educators, we must strengthen the non-pharmacological methods of managing hypertension and should be incorporated in nursing subjects.
- Nursing education should emphasize on preparing nurses to various treatment modalities and update their knowledge in all fields including complementary and alternative medicine.
- This study will enhance the nursing students to acquire knowledge about foot reflexology and its importance in maintaining the blood pressure.
- Student nurses can be trained in practicing foot reflexology so that they can inculcate it in nursing care activities.

Nursing Research

- This study can be a baseline for future studies to build upon and motivate the investigators to conduct further studies.
- There is a need for extensive research in hypertension and its non-pharmacological measures such as reiki, laughter therapy, yoga and other relaxation techniques.
- As Nursing profession focuses on evidence based practice, the nursing personnel should involve in research activities to come out with successful remedies to reduce the burden of various diseases.

Nursing Administration

- Nurse administrators should organize various staff development programs to educate the nurses on importance of foot reflexology as an adjunct to manage hypertension.
- Nurse administrators should motivate the nurses to gain knowledge regarding various alternative therapies for hypertension and implement them while caring the clients.

Recommendations

The study recommends the following for further research

- The study can be conducted with large samples to generalize the findings.
- Comparative studies can be conducted between various alternative modalities like comparison of foot reflexology with reiki.
- The study can be conducted in different clinical settings.
- Comparative study can be undertaken between the genders.

- ❖ The same study can be conducted in community settings where the family members can be taught about foot reflexology.
- ❖ Similar study can be conducted with longer duration of intervention.

Summary

This chapter dealt with summary, conclusion, implications for nursing practice and recommendations.

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ANNEXURE-A

LETTER SEEKING PERMISSION TO CONDUCT THE STUDY

From

Ms. Sasi Priya.T
Final Year M.Sc. (N),
Kongunadu College Of Nursing,
Coimbatore.

To

The Managing Director,
Kongunad Hospital,
Coimbatore.

Respected Sir,

Subject: Letter seeking permission to conduct the study.

I, Ms. Sasi Priya T, final year M.Sc (Nursing) Student of Kongunadu College of Nursing is conducting a research project in partial fulfilment of the Tamil Nadu Dr. M.G.R. Medical University, Chennai, as a part of the requirement for the award of M.Sc (Nursing) Degree.

TOPIC: "A Study to Evaluate the Effectiveness of Foot Reflexology on Blood Pressure among Patients with Hypertension at a Selected Hospital, Coimbatore."

I request you to kindly do the needful.

Thanking you,

Yours faithfully,

(Ms Sasi Priya T)

Place: Coimbatore

Date:

ANNEXURE-B

LETTER GRANTING PERMISSION TO CONDUCT THE STUDY

From

The Managing Director,
Kongunad Hospital,
Coimbatore.

To

Ms. Sasi Priya.T
Final Year M.Sc. (N),
Kongunadu College Of Nursing,
Coimbatore.

This is to certify that Ms. Sasi Priya T, final year M.Sc (Nursing) Student of Kongunadu College of Nursing is conducting a research project in partial fulfilment of the Tamil Nadu Dr. M.G.R. Medical University, Chennai, as a part of the requirement for the award of M.Sc (Nursing) Degree.

TOPIC: "A Study to Evaluate the Effectiveness of Foot Reflexology on Blood Pressure among Patients with Hypertension at a Selected Hospital, Coimbatore."

I grant permission for her to conduct the study in Kongunad Hospital.

Place: Coimbatore

Date:

ANNEXURE-C

LETTER REQUESTING OPINION AND SUGGESTIONS OF EXPERT FOR CONTENT VALIDATION OF THE RESEARCH TOOL

From

Ms. Sasi Priya.T
Final Year M.Sc (N)
Kongunadu College of Nursing
Coimbatore, Tamil Nadu.
To

Respected Madam/Sir,

Subject: Requesting opinion and suggestions of experts for establishing content validity of the tool.

I, **Ms**. **Sasi Priya T,** final year M.Sc.(Nursing) student of Kongunadu College of Nursing, Coimbatore, have selected the below mentioned statement of the problem for the research study to be submitted to The Tamil Nadu Dr.M.G.R. Medical University, Chennai as partial fulfilment for the award of Master of Science in Nursing.

Topic: "A Study to Evaluate the Effectiveness of Foot Reflexology on Blood Pressure among Patients with Hypertension at a Selected Hospital, Coimbatore."

I request you to kindly validate the tools & content developed for the study and give your expert opinion and suggestions for necessary modifications.

Thanking you

Yours Sincerely,

(Ms. Sasi Priya T)

Place: Coimbatore

Date:

Enclosed:

1) Certificate of validation
2) Criteria checklist for evaluation of tool
3) Tool for collection of data
4) Intervention (Foot Reflexology)

ANNEXURE- D

LIST OF EXPERTS FOR VALIDATION

1. **Dr. R. Karthikeyan, M.S,**
   General Surgeon,
   Kongunad Hospitals Pvt. Ltd,
   Coimbatore.

2. **Mrs Kanchana, M.Sc (N),**
   HOD, Medical Surgical Nursing,
   Sri Ramakrishna Institute of Paramedical Sciences,
   Coimbatore.

3. **Prof. P. Kuzhanthaivel, M.Sc (N),**
   Medical Surgical Nursing Department,
   KMCH College of Nursing,
   Coimbatore.

4. **Prof. B. Rajalakshmi, M.Sc (N),**
   Medical Surgical Nursing Department,
   PPG College of Nursing,
   Coimbatore.

5. **Mrs S. Bavani, M.Sc (N),**
   Associate Professor,
   Medical Surgical Nursing Department,
   KG College of Nursing,
   Coimbatore.

ANNEXURE-E

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms. SASI PRIYA T**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled "**A STUDY TO EVALUATE THE EFFECTIVENESS OF FOOT REFLEXOLOGY ON BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION AT SELECTED HOSPITAL, COIMBATORE**."

Signature of the Validator

Name:
Designation:
Date:

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms. SASI PRIYA T**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled "**A STUDY TO EVALUATE THE EFFECTIVENESS OF FOOT REFLEXOLOGY ON BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION AT SELECTED HOSPITAL, COIMBATORE**."

Signature of the Validator

Name: K. KANCHANA

Designation: HOD, MEDICAL-SURGICAL NURSING DEPT,

Date: 20.11.14 CON, SRIPMS.

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms. SASI PRIYA T**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled "**A STUDY TO EVALUATE THE EFFECTIVENESS OF FOOT REFLEXOLOGY ON BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION AT SELECTED HOSPITAL, COIMBATORE**."

P. Kuzhanthaivel

Signature of the Validator

Name: P. KUZHANTHAIVEL

Designation: PROFESSOR

Date: 05.07.2014

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms. SASI PRIYA T**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled "**A STUDY TO EVALUATE THE EFFECTIVENESS OF FOOT REFLEXOLOGY ON BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION AT SELECTED HOSPITAL, COIMBATORE**."

Signature of the Validator

Name: RAJALAKSHMI. B.

Designation: Professor.

Date: 15/4/14.

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by **Ms. SASI PRIYA T**, final year M.Sc. Nursing student of Kongunadu College Of Nursing, Coimbatore (affiliated to The Tamil Nadu Dr. M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled "**A STUDY TO EVALUATE THE EFFECTIVENESS OF FOOT REFLEXOLOGY ON BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION AT SELECTED HOSPITAL, COIMBATORE**."

Signature of the Validator

Name: S. ROVONE

Designation: Addl Prof

Date: 20/11/14

ANNEXURE-F

CERTIFICATE OF EDITING

TO WHOMSOEVER IT MAY CONCERN

Certify that the dissertation paper titled **"A study to evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension at selected hospital, Coimbatore"** by Miss. Sasi Priya.T. It has been checked for accuracy and correctness of English language used in presenting the paper is lucid, unambiguous, free of grammatical or spelling errors and apt for the purpose.

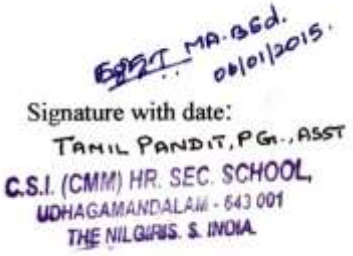
Signature with date

A.ARUL SAHAYARAJ, M.A., B.Ed.,
B.T Asst. in English.
St. Antony's Hr. Sec. School,
Kosavapatty, DINDIGUL - 624 304.

CERTIFICATE OF EDITING

TO WHOMSOEVER IT MAY CONCERN

Certify that the dissertation paper titled **"A study to evaluate the effectiveness of foot reflexology on blood pressure among patients with hypertension at selected hospital, Coimbatore"** by Miss. Sasi Priya.T. It has been checked for accuracy and correctness of Tamil language used in presenting the paper is lucid, unambiguous, free of grammatical or spelling errors and apt for the purpose.



ANNEXURE- G

CERTIFICATE OF TRAINING

KAYALVIZHI'S

Institute of Beauty Therapy and Cosmetology

Ondipudur, Coimbatore - 641 016.

Certificate

Certified that ~~Tmt~~/Selvi SASI PRIYA.T

has successfully completed the Diploma course in

FOOT REFLEXOLOGY

[1-6-2014 TO 1-7-2014]

at Kayalvizhi's Herbal Beauty Clinic, Coimbatore - 16.

Her performance was found to be good

Date : 10-07-2014

Place : Coimbatore - 16

DIRECTOR

Kayalvizhi's Herbal Beauty Clinic

KAYALVIZHI'S HERBAL BEAUTY CLINIC & INSTITUTE

Regd. No. 20040464

COIMBATORE

ANNEXURE- H

TOOL FOR DATA COLLECTION

Section A: Demographic variables of the samples.

Section B: Clinical details of the Patients with hypertension.

Section C: Blood pressure chart.

SECTION- A

DEMOGRAPHIC VARIABLES

1.	Age:	**Sample no:**

a. 31-40 years

b. 41-50 years

c. 51-60 years

d. 61-70 years

2. Sex:

a. Male

b. Female

3. Marital status:

a. Unmarried

b. Married

c. Widow/ widower

d. Divorcee

4. Education:

a. Illiterate

b. Primary Education

c. Secondary Education

d. Higher Secondary Education

e. Graduate

5. Occupation:

a. Self employed

b. Govt. Job

c. Private Job

d. Retired

e. Unemployed

6. Income per month (in Rs):

a. < Rs 5,000

b. Rs 5,001-7,500

c. Rs 7,501-10,000

d. > Rs 10,000

7. Type of family:

a. Nuclear family

b. Joint family.

8. Place of Living:

a. Rural

b. Urban

9. Diet pattern:

a. Vegetarian

b. Non vegetarian

10. Habits:

a. Smoking

b. Alcohol

c. Chewing tobacco

d. Others

11. Physical activity:

a. Sedentary

b. Moderate

c. Heavy

12. Do you practice regular exercise?

a. Yes

b. No

If yes, mention ----------

SECTION-B

CLINICAL DETAILS OF THE PATIENTS

WITH HYPERTENSION

1. Duration of hypertension:

a. < 5 years

b. 5-10 years

2. Family history of hypertension:

a. Present

b. Absent

3. Treatment for hypertension:

a. Regular treatment

b. Irregular treatment

4. Associated Illness:

a. Respiratory illness

b. Cardiac disease

c. Diabetes mellitus

d. Others

5. Duration of Medication:

a. < 5 years

b. 5-10 years

SECTION-C

BLOOD PRESSURE CHART

OBSERVATION	DAY 1		DAY 2		DAY 3		DAY 4		DAY 5	
DATE										
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
SYSTOLIC BLOOD PRESSURE (in mm Hg)										
DIASTOLIC BLOOD PRESSURE (in mm Hg)										

கீழே கொடுக்கப்பட்டுள்ளவற்றில் உங்களுக்கு ஏற்புடையதை குறிப்பிடுக

பகுதி- அ
தனி நபர் பற்றி விபரங்கள்

1. வயது
    அ) 31-40 வயது
    ஆ) 41-50 வயது
    இ) 51-60 வயது
    ஈ) 61-70 வயது

2. பாலினம்
    அ) ஆண்
    ஆ) பெண்

3. திருமண நிலை
    அ) திருமணமாகாதவர்
    ஆ) திருமணமானவர்
    இ) விதவை/மனைவியை இழந்தவர்
    ஈ) விவாகரத்து ஆனவர்

4. கல்வி நிலை
    அ) படிப்பறிவில்லாதவர்
    ஆ) துவக்கப் பள்ளி
    இ) மேல்நிலைப்பள்ளி
    ஈ) உயர்நிலைப் பள்ளி
    உ) பட்டதாரி

5. தொழில்
    அ) சுய தொழில் செய்பவர்
    ஆ) அரசு பணி
    இ) தனியார் நிறுவனம்
    ஈ) ஓய்வு பெற்றவர்
    உ) வேலை இல்லாதவர்

6. மாத வருமானம் (ரூபாய்களில்)
    அ) ரூ.5000 குறைவாக
    ஆ) ரூ.5001 - 7500
    இ) ரூ.7501 - 10000
    ஈ) ரூ.10000 - மேல்
7. குடும்ப முறை
    அ) தனிக் குடும்பம்
    ஆ) கூட்டுக் குடும்பம்

8. வாழுமிடம்
    அ) கிராமம்
    ஆ) நகரம்

9. உணவுப் பழக்கம்
    அ) சைவம்
    ஆ) அசைவம்

10. பழக்க வழக்கம்
    அ) புகைப் பழக்கம்
    ஆ) மதுப் பழக்கம்
    இ) புகையிலை பழக்கம்
    ஈ) இதர பழக்கங்கள்

11. உடல் உழைப்பு
    அ) மிக மிதமான வேலை செய்பவர்
    ஆ) மிதமான வேலை செய்பவர்
    இ) கடினமான வேலை செய்பவர்

12. நீங்கள் தினமும் உடற்பயிற்சி செய்பவரா?
    அ) ஆம்
    ஆ) இல்லை
    ஆம் எனில் குறிப்பிடவும்,**********

பகுதி- ஆ
மிகை இரத்த அழுத்தம் பற்றிய குறிப்புகள்

1. மிகை இரத்த அழுத்தம் உள்ள காலம்
    அ) 5 வருடத்திற்கும் குறைவாக
    ஆ) 5 முதல் 10 வருடங்கள்

2. குடும்பத்தில் எவர்க்கேனும் மிகை இரத்த அழுத்தம் உள்ளதா?
    அ) உண்டு
    ஆ) இல்லை

3. மிகை இரத்த அழுத்திற்கு தொடர்ந்து மருந்து உட்கொள்பவரா?
    அ) ஆம்
    ஆ) இல்லை

4. பிற தொடர்பு நோய்கள்
    அ) நுரையீரல் சம்பந்தப்பட்டவை
    ஆ) இருதயம் சம்பந்தப்பட்டவை
    இ) நீரிழிவு நோய்
    ஈ) பிற

5. மிகை இரத்த அழுத்திற்கு மருந்து உட்கொள்ளும் காலம்
    அ) 5 வருடத்திற்கும் குறைவாக
    ஆ) 5 முதல் 10 வருடங்கள்

ANNEXURE-I

STEPS OF FOOT REFLEXOLOGY

FOOT REFLEXOLOGY:

It is the therapeutic application of massage to the feet of patients with hypertension for a period of 10 minutes for 5 consecutive days as a relaxation therapy.

DURATION OF THE PROCEDURE:

The procedure is done on both feet for a period of ten minutes on each foot, once daily in the morning for 5 consecutive days.

PREPARATION:

A conducive environment, free of noise, with adequate lighting and ventilation is provided. Patient privacy is taken into consideration by providing adequate screening.

STEPS OF FOOT REFLEXOLOGY

1. Instruct the patient to wash the feet using warm water and then dry thoroughly.
2. The sample is made to lie comfortably in a supine position having the feet at the end of the bed placed on a pillow for elevation.
3. The reflexology session starts with the right foot. The left foot is covered using a covering sheet to prevent the energy transmission from one field to the other.

4. Using both hands, Massage the foot all over slowly with firm pressure applied. Start at ankle region and then move down towards the toes and then the sole of the foot.
5. With the thumb fingers apply pressure on the dorsal surface of the foot. Begins at the ankle region and is proceeded up to the tip of the toes. Pressure is applied at the meridian points for 10 seconds. This step is done for all the five toes.
6. Using the thumb fingers, apply pressure on the sole of the foot in a linear motion starting from the great toe and ending at the heel, in a zigzag manner.
7. The palm of the dominant hand is folded to fist and pressure is applied on the sole from the heel and is moved upwards to the toes. This is done in an S-shaped turn.
8. Thumb walk up the spine area from the bottom of the heel to the toes. Start at the median surface and end at the lateral surface of the foot.
9. Support the ankle part with one hand and using the other hand, flex and extend the foot by applying firm pressure. This is done twice.
10. Using the thumb and the index finger, apply firm pressure starting from ankle region and ending with the great toe. This step is repeated twice.
11. Using the thumb and the index finger, apply firm pressure from the tendon at the back and extend up to the base of the heel. This is performed two times.

12. Steps 4 to 11 are performed for the left foot covering the right foot with a blanket.
13. Finally both the feet are held at the lateral surface, using both hands. Rotate the feet twice.
14. Flex and extend the feet at the same time, by applying firm pressure. This is done twice.
15. Massage the feet using both the hands for relaxing the feet.

ANNEXURE-J

PHOTOS

MEASURES BLOOD PRESSURE

MASSAGES THE FOOT

THUMB WALKING